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SEARCH REQUEST FORM

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Requester's Full Name: ARDITH HERTZOG Examiner #: 71465 Date: 8/27/04
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Title of Invention: Please seeInventors (please provide full names): attached
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CLAIMS:

1. In the process of sulfur oxide sorption wherein a gas containing sulfur oxide is contacted at elevated process temperature with a solid sorbent material to remove sulfur oxide from the gas, the improvement which comprises:

solid sorbent material comprising at least one layered magnesia-rich chlorite-type phyllosilicate having a crystalline structure containing alternating layers of brucite structure and silicate structure.

2. The process of sulfur oxide sorption according to Claim 1 wherein said phyllosilicate contains about 10-30 weight percent magnesium oxide.

3. The process of sulfur oxide sorption according to Claim 1 wherein said solid sorbent material has deposited thereon an effective amount of oxidative metal catalyst.

4. The process of Claim 3 wherein said solid crystalline composition contains cerium oxide and vanadium pentoxide.

5. The process of Claim 3 wherein said phyllosilicate consists essentially of amesite.

6. The process of Claim 1 wherein said solid crystalline composition consists essentially of chlorite containing about 14 to 29 wt% magnesia and hydrotalcite rich in magnesia.

7. In the process of cracking a heavy hydrocarbon feed stock containing sulfur compounds, wherein a gas phase containing sulfur oxide is contacted at process temperature in the range of 700° to 820° C with a solid sorbent material to remove sulfur oxide from the gas; the improvement wherein said solid sorbent material comprises at least one magnesia-rich layered phyllosilicate having alternating silicate and brucite layers.

8. In the process of according to Claim 7 wherein said phyllosilicate contains about 10-30 weight percent magnesium oxide.

9. In the process of Claim 7 wherein said phyllosilicate consists essentially of amesite.

10. In the process of Claim 7 wherein said solid sorbent material contains hydrotalcite consisting predominately of magnesia.

11. In the process of sulfur oxide sorption wherein a gas containing sulfur oxide is contacted at elevated process temperature with a solid sorbent material to remove sulfur oxide from the gas, the improvement which comprises magnesia-rich solid sorbent material containing hydrotalcite consisting predominately of magnesia.

12. A process for sulfur oxide abatement comprising:

contacting a gaseous body containing sulfur oxide at elevated process temperature with a solid sorbent material to remove sulfur oxide from the gas;

said solid sorbent material comprising at least one layered phyllosilicate having alternating silicate and brucite layers and contains about 10-30 weight percent magnesium oxide

13. The process of Claim 12 for sulfur oxide abatement wherein the gaseous body includes a vapor phase in the fluidized bed cracking of hydrocarbons; and wherein sulfur dioxide is formed and then converted at elevated temperature, with solid sorbent material having an oxidation metal to convert sulfur dioxide to sulfur trioxide.

14. The process of Claim 12 for sulfur oxide abatement wherein the solid sorbent is regenerated and recycled, thereby enhancing sulfur oxide sorption properties.

15. A sorbent composition comprising a mixture of 10 to 90 parts by weight of magnesia-rich chlorite containing about 10-30 weight percent MgO and 10 to 90 parts by weight of hydrotalcite containing at least 50 weight percent MgO.

16. A method for making solid sorbent particles containing a mixture of:

(a) a first solid sorbent material comprising at least one layered magnesia-rich chlorite-type phyllosilicate crystalline sheet having a crystalline structure containing alternating layers of brucite structure and silicate structures, and

(b) a second solid material comprising crystalline metal oxide and/or salt compounds, comprising the steps of:

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L26 ANSWER 1 OF 15 HCA COPYRIGHT 2004 ACS on STN

137:221430 Chemical-mineralogical characterization of clay sediments around Ferrara (Italy): a tool for an environmental analysis. Bianchini, Gianluca; Laviano, Rocco; Lovo, Stefano; Vaccaro, Carmela (Dipartimento di Scienze della Terra, Universita di Ferrara, Ferrara, 44100, Italy). Applied Clay Science, 21(3-4), 165-176 (English) 2002. CODEN: ACLSER. ISSN: 0169-1317. Publisher: Elsevier Science B.V..

AB The heavy metals in water and soil are key parameters for evaluating the geochem. vulnerability of an ecosystem. These elements display a limited soly. and are easily trapped and **adsorbed** by **phyllosilicate** minerals; they are thus preferentially partitioned in the fine fraction of sediments. An anal. of recent river sediments gives information on possible water pollution, and more in general on the related ecosystem. We studied the chem.-mineralogical features of clay sediments outcropping around the town of Ferrara, with attention to their fine fraction (grain size <2 μm). X-ray fluorescence (XRF) analyses indicate that the abundance of transition trace elements, such as Cr and Ni, is pos. correlated with **MgO** wt.%, and discriminates 2 well-delineated populations of samples, resp., characterized by high (Cr >180, Ni >100 ppm) and low (Cr <180, Ni <100 ppm) contents of these elements. The mineralogical compn. of the fine fraction (<2 μm) was studied through x-ray powder diffraction (XRPD) integrated with differential thermal (DTA) and thermogravimetric analyses (DTG), showing that: low-Cr samples are characterized by a higher proportion of clay minerals in which smectite+mixed layers are more abundant than **chlorite** (Sm+ML/Chl>1); on the other hand, the high-Cr samples have a coarser grain size, and a lower abundance of clay minerals in which **chlorite** (Mg-rich **chlorite** in this group of samples) predominates over smectite+mixed layers (Sm+ML/Chl<1). These 2 distinct groups of samples are ascribed to different sources: high-Cr lithologies are related to the sedimentary contribution of the Po River, whereas low-Cr sediments plausibly derive from small rivers of Apennine origin (e.g. the Reno River). Within the high-Cr group, concns. of Ni and Cr tend to be higher than those indicated by the current environmental Italian legislation. However, in the study-case presented here, the detected high heavy-metal concns. are not related to urban-industrial-agricultural activities, but instead appear to be typical of the original lithologies. An integration of similar scientific contributions would be useful to set up a geochem.-mineralogical database as a 1st step toward the prepn. of more complete thematic maps. These would provide information relative to the behavior (e.g. distribution and abundance) of chem. elements within the different geochem. spheres, and would be useful

for recognizing and interpreting possible geochem. anomalies induced by pollution processes.

IT 1309-48-4, **Magnesia**, occurrence
(chem.-mineralogical characterization of clay sediments around
Ferrara, Italy)
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

CC 61-1 (Water)
Section cross-reference(s): 53
IT **Chlorite-group minerals**
Clays, occurrence
Feldspar-group minerals
Silicates, occurrence
Smectite-group minerals
(chem.-mineralogical characterization of clay sediments around
Ferrara, Italy)
IT 1309-48-4, **Magnesia**, occurrence 1318-74-7,
Kaolinite, occurrence 7429-90-5, Aluminum, occurrence 7439-89-6,
Iron, occurrence 7439-92-1, Lead, occurrence 7439-95-4,
Magnesium, occurrence 7439-96-5, Manganese, occurrence
7440-02-0, Nickel, occurrence 7440-03-1, Niobium, occurrence
7440-09-7, Potassium, occurrence 7440-17-7, Rubidium, occurrence
7440-23-5, Sodium, occurrence 7440-24-6, Strontium, occurrence
7440-29-1, Thorium, occurrence 7440-32-6, Titanium, occurrence
7440-39-3, Barium, occurrence 7440-45-1, Cerium, occurrence
7440-47-3, Chromium, occurrence 7440-50-8, Copper, occurrence
7440-62-2, Vanadium, occurrence 7440-65-5, Yttrium, occurrence
7440-66-6, Zinc, occurrence 7440-67-7, Zirconium, occurrence
7440-70-2, Calcium, occurrence 7723-14-0, Phosphorus, occurrence
12173-60-3, Illite 13397-26-7, Calcite, occurrence 14808-60-7,
Quartz, occurrence
(chem.-mineralogical characterization of clay sediments around
Ferrara, Italy)

L26 ANSWER 2 OF 15 HCA COPYRIGHT 2004 ACS on STN

136:88500 Short wavelength infrared (SWIR) spectral analysis of
hydrothermal alteration zones associated with base metal sulfide
deposits at Rosebery and Western Tharsis, Tasmania, and
Highway-Reward, Queensland. Herrmann, Walter; Blake, Michael;
Doyle, Mark; Huston, David; Kamprad, Julianne; Merry, Nick; Pontual,
Sasha (Centre for Ore Deposit Research, University of Tasmania,
Hobart, 7001, Australia). Economic Geology and the Bulletin of the
Society of Economic Geologists, 96(5), 939-955 (English) 2001.
CODEN: ECGLAL. ISSN: 0361-0128. Publisher: Economic Geology

Publishing Co..

AB Spectral anal. of rock samples by short wavelength IR (SWIR) anal., using the portable IR mineral analyzer (PIMA) spectrometer, is a relatively new field method with applications in mineral exploration. The technique allows rapid field-based identification of hydrothermal alteration minerals and delineation of alteration zones. Variations in mineral compn., crystallinity, and relative abundance may also be detd. **Phyllosilicates**, including white mica and **chlorite**, are particularly amenable to short wavelength IR anal. These are prominent alteration minerals in the felsic volcanic rocks in the Mount Read Volcanics, Tasmania, and the Mount Windsor subprovince, North Queensland. They have regional distributions as diagenetic and metamorphic products and exist locally in alteration zones assocd. with volcanic-hosted sulfide deposits. A geochem. and spectral investigation of white micas in the least altered rocks in the Mount Read Volcanics has shown considerable background compositional variations. The white micas range from phengite to moderately sodic muscovite and SWIR spectral measurements provide reliable ests. of their compns. **Chlorites** also have a broad compositional range in these rocks. However, SWIR spectral anal. has proven to be unreliable in detg. **chlorite** compn. in samples where **chlorite** exists in low proportions relative to white mica or in mixed assemblages with epidote. White micas in footwall alteration zones of the Rosebery stratiform Zn + Pb deposit (Tasmania) are variably phengitic, similar to those in regional background volcanics. A unit of relatively unaltered volcanoclastic sandstone in the Rosebery hanging-wall sequence contains anomalous sodic muscovite in proximity to ore lenses. White micas assocd. with the disseminated to massive pyritic Cu + Au deposits at Western Tharsis (Tasmania) and Highway-Reward (North Queensland) range in compn. from phengite to slightly sodic muscovite. In these sym. zoned alteration systems, white micas grade in compn. from phengite, in peripheral zones, to slightly sodic muscovite, in proximal zones near ore. In all three cases, the white mica compositional variation is a vector to ore that is effectively measured by SWIR spectrometry, with particular application in prospect-scale exploration. **Chlorite** compns. at Rosebery are not strictly spatially related to ore but tend to be most **magnesian** in zones of high **chlorite** abundance. In the outer alteration zone at Western Tharsis, there is a faint proximal trend to iron-rich **chlorites**. However, it does not represent a well-defined vector to ore in either case. Attempts at quant. estn. of the relative abundance of white mica and **chlorite** in mixed samples, by spectral anal., have produced results that are imprecise in comparison to geochem. derived ests. The data scatter relates to the low proportions of **chlorite** in the majority of the samples analyzed, resulting in weak **chlorite**

absorptions. Better results may be obtainable, in specific alteration or lithostratigraphic domains, by use of customized spectral unmixing software. This investigation has shown that PIMA-based SWIR spectrometry is a potent field method of mapping compositional variations in white micas that represent empirical vectors to at least some types of volcanic-hosted sulfide deposits. It has also highlighted its effectiveness in field identification of megascopically difficult or indeterminate alteration minerals, such as pyrophyllite, zunyte, and topaz, which may have genetic implications and exploration significance.

CC 53-2 (Mineralogical and Geological Chemistry)

IT **Chlorite**-group minerals

Mica-group minerals, occurrence

(alteration mineral; short wavelength IR (SWIR) spectral anal. of hydrothermal alteration zones assocd. with base metal sulfide deposits at Rosebery and Western Tharsis, Tasmania, and Highway-Reward, Queensland)

L26 ANSWER 3 OF 15 HCA COPYRIGHT 2004 ACS on STN

135:346964 **Chlorite** in chromium-platinum ores of the Urals platinum-bearing belt: characteristics of composition and paragenesis. Anikina, E. V.; Pushkarev, E. V.; Erokhin, Yu. V.; Velisov, V. A. (Inst. Geol. Geokhim., UrO RAN, Yekaterinburg, Russia). Zapiski Vserossiiskogo Mineralogicheskogo Obshchestva, 130(2), 92-100 (Russian) 2001. CODEN: ZVMOEK. ISSN: 0869-6055. Publisher: Nauka.

AB Mineralogical study of Pt-enriched chromitites within dunites of the Urals platinum-bearing belt (Nizhniy Tagil massif, Kytlym massif, and similar complexes of the Urals-Alaskan type, Uktus massif, etc.) showed that mineral assocns. concg. alkali metals, Ca, P, and a fluid constituent are widespread. Paragenetic assocns. of Cr-bearing silicates have diopside, pargasite, phlogopite, **chlorite**, Cr-contg. garnets of andradite-grossular series, Cr-contg. vesuvianite and apatite, calcite, etc. These minerals occur as multiphase inclusions within ore-forming Cr-spinels, in matrix gangue of the ore, and in ultramafic pegmatoid veins within dunites. **Chlorite** is one of the principal **phyllosilicates** obsd. in all mineral assocns., including the Pt-group metal-bearing paragenesis. **Chlorites** contg. unusually high Na₂O content (0.5-2.7 %) occur together with usual Cr-rich **chlorites**. Plotting of data from 35 microprobe analyses of **chlorite** reveals neg. correlation between Na and AlVI + Cr. Stoichiometric relations of the cations in the **chlorite** indicate the possibility that Na occurs in octahedral sites, within "talc-like" or "**brucite**-like" layers. The data does not provide a basis for considering the Na-rich **chlorites** to be mixed-layer phases. Morphol. characteristics of Nizhniy-Tagil type chromium-platinum ores and the

presence of Na-rich **chlorite** and other fluid- and alkali metal-bearing minerals in paragenesis with Cr-rich spinelids and platinum-group metal minerals reflect the existence of an unusual fluid. Such a fluid should be enriched in Ca and alkali metals, of low-temp. postmagmatic nature, and reactive in a closed ore-forming system.

- CC 53-1 (Mineralogical and Geological Chemistry)
- ST **chlorite** compn paragenetic assocn chromitite Urals platinum bearing belt
- IT Serpentine-group minerals
(Cr-enriched compn.; in paragenetic assocn. with **chlorite** in chromium-platinum ores of the Urals platinum-bearing belt)
- IT **Chlorite**-group minerals
(Na-enriched; compn., paragenetic assocn., and implication for interstitial fluid of **chlorite** in chromium-platinum ores of the Urals platinum-bearing belt)
- IT Platinum ores
(chromium-; compn., paragenetic assocn., and implication for interstitial fluid of **chlorite** in chromium-platinum ores of the Urals platinum-bearing belt)
- IT Chromitite
(compn., paragenetic assocn., and implication for interstitial fluid of **chlorite** in chromium-platinum ores of the Urals platinum-bearing belt)
- IT Chromium ores
(platinum-; compn., paragenetic assocn., and implication for interstitial fluid of **chlorite** in chromium-platinum ores of the Urals platinum-bearing belt)
- IT 12198-96-8, Pargasite 13816-47-2, Pectolite
(Cr-contg. compn.; in paragenetic assocn. with **chlorite** in chromium-platinum ores of the Urals platinum-bearing belt)
- IT 14483-19-3, Diopside 25666-97-1, Chrysolite 61076-94-6, Phlogopite 110780-60-4, Sodan phlogopite 154269-50-8, Ferrian magnesian grossular
(Cr-enriched compn.; in paragenetic assocn. with **chlorite** in chromium-platinum ores of the Urals platinum-bearing belt)
- IT 12417-10-6, Chromian clinocllore
(Na-enriched; compn., paragenetic assocn., and implication for interstitial fluid of **chlorite** in chromium-platinum ores of the Urals platinum-bearing belt)
- IT 82445-55-4, Chromian andradite 123034-78-6, Chromian ferrian grossular
(in paragenetic assocn. with **chlorite** in chromium-platinum ores of the Urals platinum-bearing belt)

L26 ANSWER 4 OF 15 HCA COPYRIGHT 2004 ACS on STN

134:254898 Gold losses from cyanide solutions. Part I: the influence of the silicate minerals. Van Vuuren, C. P. J.; Snyman, C. P.;

Boshoff, A. J. (Department of Materials Science and Metallurgical Engineering, University of Pretoria, Pretoria, 0002, S. Afr.). Minerals Engineering, 13(8-9), 823-830 (English) 2000. CODEN: MENGE. ISSN: 0892-6875. Publisher: Elsevier Science Ltd..

AB Shale from the Beatrix Gold Mine in South Africa is capable of **adsorbing** gold from cyanide solns. Petrog. investigations and gold **adsorption** expts. were undertaken on samples of these shales, in an attempt to quantify their gold **adsorption** properties. Mineralogically the shales comprise muscovite, **chlorite**, pyrophyllite, and chloritoid which suggest that the shale is a low-grade metamorphic rock. Gold **adsorption** expts. have shown that over time there is a drop in pH of the gold cyanide solns. This behavior is caused by decompn. of the **phyllosilicates** in the strongly alk. solns. Anal. of these solns. showed that high amts. of Si and Al are present. No Mg and Fe have been detected in the solns. which suggests that any dissolved Mg and Fe ppt. immediately on the surface of the solids so that gold can co-ppt. with colloidal Mg(OH)₂ and Fe(OH)₃. A tendency exists for high gold **adsorption** values to be preferentially related to high percentages of FeO (cor. for pyrite) + MgO + Al₂O₃ (cor. for muscovite) in the shales.

CC 54-2 (Extractive Metallurgy)

L26 ANSWER 5 OF 15 HCA COPYRIGHT 2004 ACS on STN

134:240322 Compositional changes in Silurian shales: conclusions based on calcite concretions research. Sramek, J. (Centre for Higher Education Studies, Prague, 11800/1, Czech Rep.). Scripta--Geology, Volume Date 1998-1999, 28/29, 89-98 (English) 2000. CODEN: SCRGEF. ISSN: 1211-281X. Publisher: Masarykova Universita v Brne, Prirodovedecka Fakulta.

AB Calcite concretions collected from eight localities of the Barrandian Silurian shales, Czech Republic, were studied. Comparison of the results of detailed lab. research of the concretions and their host shales is as follows: (1) In the concretions, calcite as the sole carbonate mineral, represents 60 - 90 wt % (arithmetic mean 78 ± 16 wt %), while in the host shales its content is only about 7 to 26 % (arithmetic mean 15.4 ± 8.7 wt %). (2) In insol. residue of concretions the amt. of Na-feldspar (occasionally also potassium feldspar) and quartz are distinctly higher than in the insol. residue of the shales, which are richer in K₂O and MgO. (3) In the latter, besides quartz, dioctahedral mica - illite / muscovite, 14 Å **chlorite** and smectite constitute a substantial portion of the rock. The semiquant. X-ray analyses of insol. residues carried out on XRD as well as on Guinier chamber, supported by results of chem., thermal (DTA - GTA) and IR **absorption** analyses were used for calcn. of contents of albite and dioctahedral illite/muscovite.

Both these minerals were used as internal stds. for fixing the content of addnl. minerals - quartz, K-feldspar, **chlorite** and smectite. Mutual comparisons of the compn. of particular concretions and their host sediments revealed a decrease of clastic quartz and feldspar grains in insol. residue of shales by 10 - 20 %. This dissoln. was compensated by the formation of authigenic illite, **chlorite** and montmorillonite/smectite. The decrease in amt. of clastic quartz and feldspars is inversely proportional to the calcite content in the host shale. A possible wider exploitation of carbonate concretions as an appropriate instrument for the study and research of diagenetic changes of the original compn. and structure of shales can be recommended. However, it has been debased by the fact that in insol. residue of many carbonate rocks (e.g. limestones) we can often find diagenetic/authigenic growth of clastic quartz and feldspars grains. As the growth of a calcite concretion proceeds quickly (the difference in the content of calcite between the central part and the outskirts of the concretion is less than 3 %) and, as the residual porosity in concretions is minimal, the difference between insol. residue of concretion and host shale can be counted as a result of the conservation of clastic minerals in concretions on one side and their dissoln. in host sediments on the other side. In shales, formation of sheet silicate (illite, **chlorite**, and smectite) proceeds.

CC 53-5 (Mineralogical and Geological Chemistry)

IT **Chlorite-group minerals**

Clay minerals

Mica-group minerals, processes

Phyllosilicate minerals

Potassium feldspars

Shale

Smectite-group minerals

(compositional and mineralogical changes in Barrandian Silurian shales and their insol. residues and comparison with compositional changes in calcite concretions contained in the shale, Czech Republic)

L26 ANSWER 6 OF 15 HCA COPYRIGHT 2004 ACS on STN

133:352739 Iowaite from the Korshunovskoe deposit (Siberian Platform).

Mazurov, M. P.; Korneva, T. A.; Zhitova, L. M.; Istomin, V. E.;

Pal'chik, N. A.; Stolpovskaya, V. N.; Titov, A. T. (Ob'edin. Inst.

Geol., Geofiz. i Mineral., SO RAN, Novosibirsk, 630090, Russia).

Zapiski Vserossiiskogo Mineralogicheskogo Obshchestva, 129(3), 80-85 (Russian) 2000. CODEN: ZVMOEK. ISSN: 0869-6055. Publisher: Nauka.

AB New occurrence of iowaite, $\text{Mg}_6\text{Fe}_{23}(\text{OH})_{16}\text{Cl}_{12} \cdot 4\text{H}_2\text{O}$, in the skarn-adjacent halo of the Korshunovskoe ore deposit, southern Siberian Platform, is reported. The mineral is related to highly concd. hydrothermal brines deriving from the intrusion of basic magma (crystg. to dolerite) into the platform cover; mineral genesis

occurred as a result of contact metasomatic transformations in Cambrian carbonate-evaporite beds. The iowaite occurs as bluish-green close-grained crystals in calcite-**brucite** veinlets and cavities, in **magnesian** skarn and altered dolostones. Assocd. minerals are chlormagaluminite, meixnerite, thaumasite, ekaterinite, shabynite, hibbingite, pyroaurite and korshunovskite, all of which post-date serpentine-chlorite-talc assemblages. Microprobe, thermal anal., powder X-ray diffraction, IR and ESR spectroscopic, and optical studies were made. The iowaite contains MgO 39.80, Fe₂O₃ 24.61, and Cl 5.41 % and has unit-cell parameters $a = 3.120 \pm 0.0005$ and $c = 24.12 \pm 0.02$ Å. The structure collapses at 370 to 600°. The **adsorbed** water (10.62-11.25% of total wt.) is continuously released during heating to 260°. The total loss on ignition is 36.86-37.50 %. The ESR spectra of iowaite reveal the presence of Fe³⁺ in the crystal structure and Mn²⁺ in impurity calcite. The Vickers microhardness (at 10 g load) is 18-27 kg/mm². The optical properties are like those of the holotype. The iowaite occurs as bluish-green close-grained crystals in calcite-**brucite** veinlets and cavities in **magnesian** skarn and altered dolostones.

CC 53-1 (Mineralogical and Geological Chemistry)

IT Hydrothermal fluids (geological)

(brines; genesis of iowaite in **magnesian** skarn and altered dolostones of the Korshunovskoe ore deposit, Siberian Platform)

IT 12418-78-9, Iowaite

(compn., diagnostic optical and phys. properties, and genesis of iowaite in **magnesian** skarn and altered dolostones of the Korshunovskoe ore deposit, Siberian Platform)

L26 ANSWER 7 OF 15 HCA COPYRIGHT 2004 ACS on STN

133:124614 Interaction between aqueous chromium solutions and layer silicates. Brigatti, M. F.; Franchini, G.; Lugli, C.; Medici, L.; Poppi, L.; Turci, E. (Department of Earth Sciences, University of Modena and Reggio Emilia, Modena, I 41100, Italy). Applied Geochemistry, 15(9), 1307-1316 (English) 2000. CODEN: APPGEY. ISSN: 0883-2927. Publisher: Elsevier Science Ltd..

AB Interactions between Cr in aq. solns. and **phyllosilicates** were studied to det.: the amt. of Cr⁶⁺ to Cr³⁺ redn. in aq. solns. by Fe²⁺-bearing **phyllosilicates**; and removal of Cr species from soln. by interaction with **phyllosilicates** as a function of Cr³⁺ concn. and anionic environment. **Chlorite**, corrensite, and montmorillonite were reacted with solns. contg. Cr⁶⁺ (1.62×10^{-3} N, 5.77×10^{-3} N, and 1.32×10^{-1} N, resp.). Cr³⁺ **sorption**/desorption by saponite was studied in different anionic environments (Cl⁻, NO₃⁻, CH₃COO⁻) and at different initial Cr³⁺ concns. (3.21×10^{-3} N, $5.49 \times$

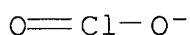
10-3 N, 8.49 + 10-3 N). The extent of Cr6+ redn. and the amt. of Cr removed by **phyllosilicates** were measured by analyzing the liq. portion sepd. by centrifugation after controlled exposure periods. Minerals were studied by chem., thermal, and X-ray powder diffraction analyses. Results showed that: Fe2+-bearing **phyllosilicates** sorbed Cr and reduced Cr6+ to Cr3+; the extent of redn. depended on soln. concn. and on mineral crystal chem.; Cr3+ **sorption** isotherms showed the degree of uptake depended on initial metal concn. in soln. and on the anionic environment, the order of effectiveness being Cl- .simeq. NO-3 > CH3COO-; Cr3+ was retained in the mineral substrate and its release was difficult.

IT 14998-27-7, **Chlorite**

(pH, iron content, anionic environment, and chromium species and concn. effect on aq. hexavalent chromium interaction with layer silicates)

RN 14998-27-7 HCA

CN Chlorite (8CI, 9CI) (CA INDEX NAME)

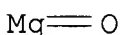


IT 1309-48-4, **Magnesium oxide**, reactions

(**phyllosilicates** contg.; pH, iron content, anionic environment, and chromium species and concn. effect on aq. hexavalent chromium interaction with layer silicates)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



CC 60-4 (Waste Treatment and Disposal)

Section cross-reference(s): 19, 53

ST chromium interaction layer silicate; iron rich clay mineral interaction chromium; **chlorite** corrensite montmorillonite saponite interaction chromium; waste solids contaminated soil chromium interaction; redn hexavalent chromium **phyllosilicate**; **adsorption** desorption trivalent chromium **phyllosilicate**

IT **Phyllosilicate** minerals

(iron-rich; pH, iron content, anionic environment, and chromium species and concn. effect on aq. hexavalent chromium interaction with layer silicates)

IT **Silicates**, reactions

(**phyllo**-, iron-rich; pH, iron content, anionic environment, and chromium species and concn. effect on aq. hexavalent chromium interaction with layer silicates)

IT Adsorption

Desorption

(trivalent chromium; pH, iron content, anionic environment, and chromium species and concn. effect on aq. hexavalent chromium interaction with layer silicates)

IT 1318-93-0, Montmorillonite, reactions 1319-41-1, Saponite

12173-14-7, Corrensite 14998-27-7, Chlorite

(pH, iron content, anionic environment, and chromium species and concn. effect on aq. hexavalent chromium interaction with layer silicates)

IT 1305-78-8, Calcium oxide, reactions 1308-38-9, Chromium oxide (Cr₂O₃), reactions 1309-37-1, Ferric oxide, reactions

1309-48-4, Magnesium oxide, reactions

1313-59-3, Sodium oxide, reactions 1344-28-1, Alumina, reactions

1344-43-0, Manganese oxide, reactions 1345-25-1, Iron oxide (FeO), reactions 7631-86-9, Silica, reactions 7732-18-5, Water, reactions 12136-45-7, Potassium oxide, reactions 13463-67-7,

Titanium, reactions

(phyllosilicates contg.; pH, iron content, anionic environment, and chromium species and concn. effect on aq. hexavalent chromium interaction with layer silicates)

IT 12408-02-5, Hydrogen ion, occurrence

(phyllosilicates; pH, iron content, anionic environment, and chromium species and concn. effect on aq. hexavalent chromium interaction with layer silicates)

L26 ANSWER 8 OF 15 HCA COPYRIGHT 2004 ACS on STN

120:195157 Micropore formation due to thermal decomposition of hydroxide layer of **magnesian chlorites**: interactions with water. Villieras, Frederic; Yvon, Jacques; Francois, Michele; Cases, Jean Maurice; Lhote, Francois; Uriot, Jean Pierre (Lab. Environ. Mineral., CNRS, Vandoeuvre les Nancy, 54 501, Fr.). Applied Clay Science, 8(2-3), 147-68 (English) 1993. CODEN: ACLSER. ISSN: 0169-1317.

AB The first stage of dehydroxylation of **magnesian chlorites** involves the dehydroxylation of the **brucite**-like layer which removed water from the structure. This reaction provokes the modification of basal reflection intensities and the development of long basal spacings. IR spectroscopy as well as thermogravimetry and water vapor **adsorption** reveal the formation of structural micropores filled with mol. atm. water once the samples are cooled down. A high temp. treatment is needed to release the different phases condensed in these micropores. A heterogeneous dehydroxylation mechanism is proposed involving magnesium and oxygen concn. in acceptor regions and micropores in donor regions. This leads to a structure where micropores and enriched oxide interlayers alternate along the z-axis of the mineral which generates long-basal spacings.

According to this model theor. calcn. shows that only a part of the microporous vol. is accessible to water vapor.

CC 49-4 (Industrial Inorganic Chemicals)

ST micropore formation **magnesian chlorite**;
dehydroxylation **magnesian chlorite** micropore
formation

IT **Chlorite**-group minerals

(**magnesian**, micropore formation due to thermal decompn.
of hydroxide layer of)

L26 ANSWER 9 OF 15 HCA COPYRIGHT 2004 ACS on STN

113:135791 Spectral characteristics of **chlorites** and
magnesium-serpentines using high-resolution reflectance
spectroscopy. King, Trude V. V.; Clark, Roger N. (U. S. Geol.
Surv., Denver, CO, 80225, USA). Journal of Geophysical Research,
[Solid Earth and Planets], 94(B10), 13997-4008 (English) 1989.
CODEN: JGRPE5. ISSN: 0885-3401.

AB The study using high-resoln. reflectance spectroscopy (0.25-2.7
μm) focuses on 2 primary **phyllosilicate** groups,
serpentines and **chlorites**. The results show that it is
possible to spectrally distinguish between isochem. end-members of
the Mg-rich serpentine group (chrysotile, antigorite, and lizardite)
and to recognize spectral variations in **chlorites** as a
function of Fe/Mg ratio (.apprx.8-38 wt % Fe). The position and
relative strength of the 1.4-μm **absorption** feature in
the trioctahedral **chlorites** are correlated to the total Fe
content and/or the Mg/Si ratio and the loss of ignition values of
the sample. Spectral differences in the 2.3-μm wavelength region
can be attributed to differences in lattice environments and are
characteristic for specific trioctahedral **chlorites**. The
1.4-μm feature in the isochem. Mg-rich serpentines (total Fe
content .apprx.1.5-7.0 wt. %) show marked spectral differences,
apparently due to structural differences.

CC 53-1 (Mineralogical and Geological Chemistry)

ST **magnesian** serpentine reflectance spectroscopy;
chlorite serpentine reflectance spectroscopy

IT **Chlorite**-group minerals

Serpentine-group minerals

(high-resoln. reflectance spectroscopy of, identification in
relation to)

IT Spectrometry

(reflection, high-resoln., of **chlorites** and
magnesium-serpentines)

L26 ANSWER 10 OF 15 HCA COPYRIGHT 2004 ACS on STN

90:74481 Thermal treatment of gels belonging to the **magnesium**
oxide-silica-water and **magnesium oxide**
-alumina-silica-water system in the presence of alkali metal ions.

De Vynck, Ivan A. (Lab. Chim. Miner. Appl., Univ. Etat Gand, Ghent, Belg.). Silicates Industriels, 43(9), 187-94 (French) 1978. CODEN: SIINAT. ISSN: 0037-5225.

AB Alcoholate gels with mol. ratios corresponding to various Mg- and Mg-Al silicate compns. were treated over a range of LiOH and KOH concns. in hydrothermal systems at 300-650° ad 88-500 kg/cm². Both of the hydroxides promoted **phyllosilicate** crystn. from the treated gels. At moderate concns., LiOH enhanced the crystn. of chrysotile [12001-29-5], talc [14807-96-6], and serpentine [61027-16-5]; crystn. of 3-dimensional silicate structures contg. tetrahedrally coordinated Al was favored by high concns. of LiOH. At >400°, mica [12001-26-2] minerals are formed in systems contg. KOH. In sep. expts., natural chrysotile, placed in hydrothermal alk. solns. (contg. LiOH, NaOH, or KOH), altered under varying conditions to talc, mica, phlogopite, **brucite**, or saponite; decompn. to an amphibole phase was not obsd.

CC 53-1 (Mineralogical and Geological Chemistry)

IT **Chlorite** (the mineral)

Mica

Serpentine (the mineral)

(formation of, by hydrothermal alteration of alcoholate gels)

L26 ANSWER 11 OF 15 HCA COPYRIGHT 2004 ACS on STN

70:13347 Monoclinic **chlorite** with a **magnesian** ripidolite composition. Ginzburg, I. V. (USSR). Trudy Mineralogicheskogo Muzeya, Akademiya Nauk SSSR, No. 18, 41-9 (Russian) 1968. CODEN: TMIMAV. ISSN: 0371-9669.

AB Gneisses, contacting directly the coarse-laminal **chlorite** rock layer (apparent thickness 20-5 cm.), were found in a small outcrop northwest of Kalm Lake in the Kola Peninsula. The laminas of green **chlorite** were situated parallel to the contact plane and formed massive finely corrugated rocks. Formation of **chlorite** in the area was related to the reaction of primary igneous amphibolite and primary sedimentary gneisses during metasomatism. Reflections of only a single mineral phase were detected on electron diffraction patterns. The mineral had structure of 1M type without traces of admixts. of other layered silicates. It was monoclinic, C2/m, most ordered thin-layer structure, and unit cell parameters of $a = 5.31$, $b = 9.22$, $c = 14.31$ Å, $\beta = 96^\circ 50'$. The mineral was light greenish brown in transmitted light, pleochroism from light green on Z to light brown on X, and $n_x 1.618$, $n_y 1.611$, and $n_z 1.610$. Differential heating curve had 3 endothermic effects in general similar to those of ripidolites. The highest **absorption** of heat (1 endothermic effect) was caused by removal of OH from **brucite** layer at 610-90°. The 2nd endoeffect (785-90) was related to **absorption** of heat during

liberation of H by a talc layer. The 3rd endoeffect (810-900°), converging with an exoeffect, practically did not cause any loss of wt. The exoeffect reflected decompn. of a complex talc layer which signified a total decompn. of the mineral. The temp. of this effect was similar to those in other ripidolites. A crystallochem. formula was offered with consideration for possible ordering in distribution of Fe²⁺ between **brucite** and talc layer in the structure of this **chlorite**.

CC 53 (Mineralogical and Geological Chemistry)

ST **chlorite** ripidolite; ripidolite **chlorite**

IT Pleochroism

(of **chlorite** of Kalm Lake area, Kola Peninsula)

IT **Chlorite** (mineral)

(properties of monoclinic, of Kalm Lake area, Kola Peninsula)

L26 ANSWER 12 OF 15 HCA COPYRIGHT 2004 ACS on STN

62:65296 Original Reference No. 62:11541b-f Characteristics and genesis of boron minerals, ludwigite, ferro-ludwigite, szaibelyite, and camsellite, from the mines of Brosso, Ivrea. Giussani, Alberto; Vighi, Luciano (Univ. Milan). Periodico di Mineralogia, 33(2/3), 471-500 (Unavailable) 1964. CODEN: PEMIA7. ISSN: 0369-8963.

AB The pyrite-hematite ore deposits of Brosso are on contacts between Traversella diorite and metamorphites in the zone from Val di Lanzo to Sesia, with inserted dolomitic limestones (skarns), and contact minerals (forsterite, **brucite**, antigorite, chrysotile, talc, **chlorite**, monoclinic pyroxene, amphibole, epidote, apatite). Magnetite is intimately intergrown with ludwigite, the latter in thin prisms of greenish black color, up to 7 cm. in length, in thinnest sections showing strong pleochroism green-red-brown, in re-flected light of low reflectance, and intense anisotropy and pleochroism effects. Ferroludwigite is intimately assocd, with ludwigite, and shows those optical characteristics even more distinctly. Sometimes ferro-ludwigite is distinctly zonal, particularly visible after etching with concd. HCl. X-ray data (from powder diagrams) are extensively tabulated, but no chem. anal. could be given. Szaibelyite and camsellite appear in greenish-white dense masses, which, under the microscope, show fine interwoven acicular crystals, colorless, but with strong **absorption**, max., Y and Z, min., X extinction is parallel. Optically neg., 2 V 0-25°. In zonal crystals the central portions show mostly 2 V of 15-25°, whereas the peripheral portions are nearly uniaxial, ng, 1.648; np, 1.575, corresponding nearly to ideal szaibelyite, (Mg, Mn)(HBO₃). X-ray diffraction data are given. The paragenesis with typical contact minerals as mentioned above, magnetite, and serpentine, dolomite, is indicated by pseudomorphs of szaibelyite after ludwigite, and the replacement of ludwigite by magnetite grown along the cleavage planes. Pyrite is always surrounded by szaibelyite. Details of succession are demonstrated.

Two phases are distinguished, (1) of pneumatolytic type characterized by the introduction of B and Fe into a highly **magnesian** country rock, but with very subordinate Si and OH, no free SiO₂ appearing, and only antigorite and pennine as silicates. It is followed by a phase (2) which is hydrothermal, with addn. of Fe, some Cu, and S, probably also of Mn and CO₂, in the presence of water. Here ludwigite formed in (1) is hydrated, and replaced by szaibelyite. The recrystn. of a very well-developed dolomite, and traces of chalcopyrite are characteristic of this (2) phase. In every case, the early formation of ludwigite in (1) and its later replacement by hydrothermal szaibelyite (and camsellite) is very typical of the Brosso deposits.

CC 25 (Mineralogical and Geological Chemistry)

L26 ANSWER 13 OF 15 HCA COPYRIGHT 2004 ACS on STN

60:67196 Original Reference No. 60:11785a-c Mineralogy of an ancient crust of weathering on rocks of the Imandra-Varzuga series south of the Khibiny. Afanas'ev, A. P. Kora Vyvetrivaniya (No. 6), 13-47 (Unavailable) 1963. CODEN: KOVIAX. ISSN: 0454-353X.

AB During the past 10 yrs. in various places south of the Khibiny alk. massif, geol. surveys discovered an ancient crust of weathering covered by moraines of the last glaciation. This crust of weathering developed on Proterozoic **chlorite** schists. A study of the minerals of this ancient crust of weathering revealed stage-type conversion of **chlorite** into kaolinite: **chlorite** → jefferisite (thermally unstable **chlorite** having **adsorbed** water and exchangeable cations) → differently leached **chlorite** packets; **MgO** 13.52-3.45%; hydrochlorite (composite stratified mineral having c 13.9-13.6 kX) → swelling mineral (montmorillonite with c 12 kX) → kaolinite (without strict ordering along the c axis) → kaolinite (ordered on c axis; well crystd.). Depending on certain definite conditions the degree of crystn. in newly-formed kaolinite varied: in some cases it is halloysite, in others a mineral similar to fire clay. The hydrochlorite, which has composite-stratified structure made from differently leached **chlorite** packets, contains packets of **chlorite**, swelling **chlorite**, and vermiculite. The hydrochlorites are similar to such nonordered composite-stratified formations as biotite and hydrophlogopite. Its main characteristics are the large no. of various packets, forming hydrochlorites, and a gradual transition between them according to the degree of leaching of the **brucite** layer. 23 references.

IT 14998-27-7, **Chlorite**

(kaolinite formation from, in weathering crust south of Khibiny massif)

RN 14998-27-7 HCA

CN Chlorite (8CI, 9CI) (CA INDEX NAME)



- CC 25 (Mineralogical and Geological Chemistry)
 IT Minerals
 (in weathering crust of **chlorite** schist south of
 Khibiny massif, U.S.S.R.)
 IT Schists
 (weathering crust of **chlorite**, south of Khibiny massif)
 IT 1318-74-7, Kaolinite
 (formation of, from **chlorite** in weathering crust south
 of Khibiny massif)
 IT 14998-27-7, **Chlorite**
 (kaolinite formation from, in weathering crust south of Khibiny
 massif)
- L26 ANSWER 14 OF 15 HCA COPYRIGHT 2004 ACS on STN
 54:88337 Original Reference No. 54:16771i,16772a-b Formation of
chlorite-like structures from montmorillonite. Slaughter,
 M.; Milne, I. (Gulf Research & Dev. Co., Pittsburgh, PA). Clays
 Clay Minerals, Proc. Natl. Conf. Clays Clay Minerals, 7th,
 Washington, Volume Date 1958 114-24 (Unavailable) 1960.
- AB Lab. preps. of **chlorite**-like structures from crude
 Wyoming bentonite and MgCl_2 or AlCl_3 are successful under such a
 wide variety of mixing conditions, concns., rates of base addn., and
 phys. conditions that it is concluded that an **adsorption**
 process on unit layer level is involved, the actual stable preps.
 emerging only as the recovered solids. Best **magnesian**
 preps. contain approx. 6 $\text{Mg}(\text{OH})_2$ per cell, but exsolve some
brucite on long standing; best aluminian preps. contain
 3.75 $\text{Al}(\text{OH})_3$. Completely reacted **magnesian** products are
 stable towards H_2O or ethylene glycol, but partially reacted
 products are expansible. Wet preps. dry directly to a 14.8 Å.
 basal period. Wet aluminian preps. pass through ordered states at
 19.9 and 17.3 Å., before stabilizing at 14.7 Å. The probability of
 comparable reactions in sediments and soils is discussed.
- CC 19 (Glass, Clay Products, Refractories, and Enameled Metals)
 IT Bentonite
 (**chlorite**-like structure formation from, AlCl_3 and
 MgCl_2 in)
 IT **Adsorption**
 (of aluminum chloride and MgCl_2 by bentonite, **chlorite**
 -like structure formation thereby)
 IT 1318-93-0, Montmorillonite
 (**chlorite**-like structure formation from, AlCl_3 and
 MgCl_2 in)
 IT 7446-70-0, Aluminum chloride 7786-30-3, Magnesium chloride

(reaction with bentonite, **chlorite**-like structure formation from)

L26 ANSWER 15 OF 15 HCA COPYRIGHT 2004 ACS on STN

52:29233 Original Reference No. 52:5219b-e **Chlorite** in quartz veins of the Kvarkush Plateau in the Ural. Starkov, N. P. (State Univ., Molotov). Zapiski Vserossiiskogo Mineralogicheskogo Obshchestva, 86, 505-8 (Unavailable) 1957. CODEN: ZVMOEK. ISSN: 0869-6055.

AB In diaphoritic micaceous quartzites, and multiple albite-chloritesericite-quartz schists, epidote-albite-actinolite schists, epidote-glaucophane-garnet schists, with gabbro diabase intrusions, hydrothermal veins are scarcely developed, among which albite-**chlorite**-quartz assocns. are particularly interesting. The **chlorite** is dark-green, fine-scaly, filling small lenses and veinlets, with characteristic worm-shaped aggregates of 0.3 to 0.5 mm. length, of the tabular crystals stacked together in typical multilayer parcels. **Chlorite** distinctly replaces older albite in these veins. Extinction parallel, $\gamma = 1.632$; $\alpha = 1.628$; weak pleochroism in yellowish and greenish tints; **absorption** $\alpha > \gamma$; blue-violet anomalous interference colors. Analysis: SiO₂ 26.65; Al₂O₃ 23.80; TiO₂ -; Fe₂O₃ 0.93; FeO 21.22; MnO 0.43; NiO trace; MgO 16.28; CaO 0.36; H₂O + 9.33; H₂O -1.64%. The octahedral coordination trivalent cations (Al³⁺, Fe³⁺) are nearly equal in no. to those in tetrahedral coordination in the crystallochem. formula which corresponds to a prochlorite in Serdyuchenko's classification of the **chlorites** (series prochlorite-corundophilite). A microthermal analysis shows two endothermic effects of dehydration at 550° to 630° (strong), and 700° to 780° (weak), and a weak exothermic effect at 850°; this indicates the formation of forsterite. A slight endothermic effect at 440° corresponds to the dehydration of **brucite**.

CC 8 (Mineralogical and Geological Chemistry)

IT **Chlorite**-group minerals

(in quartz veins of Kvarkush Plateau, Ural Mts.)

IT 14808-60-7, Quartz

(**chlorite** in, of Kvarkush Plateau, Urals)

=> d 127 1-36 ti

L27 ANSWER 1 OF 36 HCA COPYRIGHT 2004 ACS on STN

TI Evolution of alteration zones developed around Au-Ag-Te ores in Panormos Bay, Tinos, Cyclades. The physicochemical ratios approach

L27 ANSWER 2 OF 36 HCA COPYRIGHT 2004 ACS on STN

- TI Mineral composition of Devonian and Quaternary clays of Latvia and its changes on treatment with sulfuric acid solutions
- L27 ANSWER 3 OF 36 HCA COPYRIGHT 2004 ACS on STN
- TI A refined XRD method for the determination of **chlorite** composition and application to the McGerrigle Mountains anchizone in the Quebec Appalachians
- L27 ANSWER 4 OF 36 HCA COPYRIGHT 2004 ACS on STN
- TI Fluid composition at the blueschist-eclogite transition in the model system $\text{Na}_2\text{O}-\text{MgO}-\text{Al}_2\text{O}_3-\text{SiO}_2-\text{H}_2\text{O}-\text{HCl}$
- L27 ANSWER 5 OF 36 HCA COPYRIGHT 2004 ACS on STN
- TI Estimation of oxygen diffusivity from anion porosity in minerals
- L27 ANSWER 6 OF 36 HCA COPYRIGHT 2004 ACS on STN
- TI Influence of time and temperature on reactions and transformations of clinocllore as a ceramic clay mineral
- L27 ANSWER 7 OF 36 HCA COPYRIGHT 2004 ACS on STN
- TI Relations between ash yield and chemical and mineral composition of coals
- L27 ANSWER 8 OF 36 HCA COPYRIGHT 2004 ACS on STN
- TI Chemical variation of olivine in the serpentinite of the central section in the Xerolivado chrome mine of Vourinos, Greece
- L27 ANSWER 9 OF 36 HCA COPYRIGHT 2004 ACS on STN
- TI Pre-ore hydrothermal alteration in an unconformity-type uranium deposit
- L27 ANSWER 10 OF 36 HCA COPYRIGHT 2004 ACS on STN
- TI Contact metamorphism of dolomitic limestone in the aureole of Miyako granitoids, Iwate Prefecture, Japan
- L27 ANSWER 11 OF 36 HCA COPYRIGHT 2004 ACS on STN
- TI Oriented **chlorite** lamellae in chromite from the Pedra Branca mafic-ultramafic complex, Ceara, Brazil
- L27 ANSWER 12 OF 36 HCA COPYRIGHT 2004 ACS on STN
- TI Iron-57 Moessbauer investigation of naturally oxidized **chlorite**
- L27 ANSWER 13 OF 36 HCA COPYRIGHT 2004 ACS on STN
- TI Magnetite-bearing **magnesian** skarns of Mongolia
- L27 ANSWER 14 OF 36 HCA COPYRIGHT 2004 ACS on STN
- TI Fracture zone drilling on the Southwest Indian Ridge. 1.

Geochemistry and Mineralogy. 7. Geochemistry and mineralogy of sediments, Atlantis II Fracture Zone, southwest Indian Ocean

- L27 ANSWER 15 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI A calculated petrogenetic grid for ultramafic rocks in the system calcium oxide-iron(2+) oxide-magnesium oxide -alumina-silica-carbon dioxide-water at low pressures
- L27 ANSWER 16 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Phase relations and metamorphic history of a clinohumite-chlorite-serpentine-marble from the Western Tauern Area (Austria)
- L27 ANSWER 17 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Phase and structure transformations of muscovite into trioctahedral layered silicates
- L27 ANSWER 18 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Chlorites from kimberlites, trap rocks, and productive diamond-containing crusts of Upper Paleozoic and Mesozoic western Yakutia
- L27 ANSWER 19 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Weathering and clay formation in a dunite deposit at Asbestos
- L27 ANSWER 20 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Weathering and clay formation in a dunite deposit at asbestos
- L27 ANSWER 21 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Mineralogical characteristics of the magnesian-skarn deposits in southeast Bulgaria
- L27 ANSWER 22 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Evolution and mineral facies of deep-seated contact-metamagmatic rocks of Khigan, Khabarovsk Territory
- L27 ANSWER 23 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Calcium-containing chlorite from basic rocks of Pechenga nickel-bearing intrusives
- L27 ANSWER 24 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Formation of lamellar silicates during phase and structural transformations of dioctahedral montmorillonite under pressure
- L27 ANSWER 25 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Mineralogical and technological characteristics of magnesium chlorite from Jordanow near Sobotka (Lower Silesia)

- L27 ANSWER 26 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Thermal, structural, and chemical properties of **chlorite** from Papuk
- L27 ANSWER 27 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Chemical constitution and correlation of optical properties with the chemical composition of **chlorites** by statistical correlation analysis
- L27 ANSWER 28 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Cross-fibrous **chlorite** and **brucite** from Kumyshkan
- L27 ANSWER 29 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Thermoanalytic study of **chlorites** from near-ore rocks of the Mauk copper-pyrite deposit in the Middle Urals
- L27 ANSWER 30 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Some characteristic features of carbonatites in the Konder intrusive massif (the Aldan Shield)
- L27 ANSWER 31 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Thermal diagrams of minerals
- L27 ANSWER 32 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Monticellite rock from the Akhmatovsk Mine
- L27 ANSWER 33 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Wall-rock alteration in the Broken Hills Range, Nevada
- L27 ANSWER 34 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI Regularity of association of minerals in the Archean of East Siberia
- L27 ANSWER 35 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI X-ray study of thermal transformations in some **magnesian chlorite** minerals
- L27 ANSWER 36 OF 36 HCA COPYRIGHT 2004 ACS on STN
TI A new manganese **chlorite** from Langban

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L27 ANSWER 5 OF 36 HCA COPYRIGHT 2004 ACS on STN

129:83821 Estimation of oxygen diffusivity from anion porosity in minerals. Zheng, Yong-Fei; Fu, Bin (Department of Earth and Space Sciences, University of Science and Technology of China, Hefei, 230026, Peop. Rep. China). Geochemical Journal, 32(2), 71-89 (English) 1998. CODEN: GEJOBE. ISSN: 0016-7002. Publisher: Geochemical Society of Japan.

AB An empirical model for predicting oxygen diffusivity from anion porosity is presented for a wide range of minerals. It is based on the examn. of exptl. diffusion data under anhydr. and hydrothermal conditions. The relationship between activation energies and pre-exponential factors in all minerals is assumed to obey a common compensation law regardless of diffusion medium (H2O, OH-, CO2 or O2). However, the H2O mols. and OH- groups are relatively small in vol. and thus can migrate within mineral structures with given anion porosities easier than the CO2 and O2. As a result, the rates of oxygen diffusion in minerals under hydrothermal conditions are greater than those under anhydr. conditions. The Arrhenius parameters for oxygen diffusion in about 130 minerals have been

estd. for anhydr. and hydrothermal conditions, resp. The empirical results on oxygen diffusivity are internally consistent for the minerals of geochem. interest and thus can be applicable to oxygen isotope geospeedometry during cooling of high-temp. mineral assemblages.

IT 1317-43-7, **Brucite** ($\text{Mg}(\text{OH})_2$)
 (oxygen self-diffusion in minerals estd. from anion porosity by empirical model for both anhydr. and hydrothermal conditions)
 RN 1317-43-7 HCA
 CN Brucite ($\text{Mg}(\text{OH})_2$) (9CI) (CA INDEX NAME)

HO-Mg-OH

CC 53-1 (Mineralogical and Geological Chemistry)

IT Amphibole-group minerals
 Apatite-group minerals
 Axinite-group minerals
 Carbonate minerals
 Chlorite-group minerals
 Feldspar-group minerals
 Feldspathoid-group minerals
 Garnet-group minerals
 Mica-group minerals, properties
 Olivine-group minerals
 Oxide minerals
 Plagioclase-group minerals
 Potassium feldspars
 Pyroxene-group minerals
 Pyroxenoid-group minerals
 Serpentine-group minerals
 Silicate minerals
 Spinel-group minerals
 Tourmaline-group minerals

(oxygen self-diffusion in minerals estd. from anion porosity by empirical model for both anhydr. and hydrothermal conditions)

IT 1302-27-8, Biotite ($(\text{Fe}_{0.4-0.8}\text{Mg}_{0.2-0.6})_3\text{K}(\text{Si}_3\text{Al})[(\text{OH})_{0.5-1}\text{F}_{0-0.5}]\text{2O}_{10}$) 1302-34-7, Leucite ($\text{AlK}(\text{SiO}_3)_2$) 1302-37-0, Spodumene ($\text{AlLi}(\text{SiO}_3)_2$) 1302-50-7, Celsian ($\text{Al}_2\text{Ba}(\text{SiO}_4)_2$) 1302-52-9, Beryl ($\text{Al}_2\text{Be}_3(\text{SiO}_3)_6$) 1302-54-1, Anorthite ($(\text{Ca}_{0.9-1}\text{Na}_{0-0.1})(\text{Si}_2-2.1\text{Al}_{1.9-2})\text{O}_8$) 1302-57-4, Grossular ($\text{Al}_2\text{Ca}_3(\text{SiO}_4)_3$) 1302-61-0, Hercynite (Al_2FeO_4) 1302-62-1, Almandine ($\text{Al}_2\text{Fe}_3(\text{SiO}_4)_3$) 1302-67-6, Spinel ($\text{Mg}(\text{AlO}_2)_2$) 1302-68-7, Pyrope ($\text{Al}_2\text{Mg}_3(\text{SiO}_4)_3$) 1302-74-5, Corundum (Al_2O_3), properties 1302-76-7, Kyanite ($\text{Al}_2\text{O}(\text{SiO}_4)$) 1302-88-1, Cordierite ($\text{Mg}_2[\text{Al}_4\text{O}_3(\text{SiO}_3)_5]$) 1305-78-8, Calcium oxide (CaO), properties 1306-04-3, Chlorapatite ($\text{Ca}_5\text{Cl}(\text{PO}_4)_3$) 1306-05-4, Fluorapatite ($\text{Ca}_5\text{F}(\text{PO}_4)_3$) 1306-06-5, Hydroxylapatite ($\text{Ca}_5(\text{OH})(\text{PO}_4)_3$) 1306-41-8, Monazite-(Ce)

((Ce_{0.5}-1La₀-0.5Nd₀-0.5Th₀-0.5)(PO₄)) 1308-31-2, Chromite
 (Cr₂FeO₄) 1309-38-2, Magnetite (Fe₃O₄), properties 1310-14-1,
 Goethite (Fe(OH)O) 1310-36-7, Jacobsonite 1310-98-1, Manganite
 (Mn(OH)O) 1313-12-8, Manganosite (MnO) 1317-43-7,
 Brucite (Mg(OH)₂) 1317-45-9, Cassiterite (SnO₂)
 1317-60-8, Hematite (Fe₂O₃), properties 1317-64-2, Lepidolite
 ((Li_{1.5}-2Al₁-1.5)K(Si₃-4Al₀-1)[F_{0.5}-1(OH)O-0.5]2O₁₀) 1317-74-4,
 Periclase (MgO) 1317-80-2, Rutile (TiO₂) 1317-92-6,
 Tenorite (CuO) 1317-99-3, Uraninite (U_{0.75}-1O₂) 1318-23-6,
 Boehmite (Al(OH)O) 1318-49-6, Epidote (Ca₂[Al₂Fe(OH)(SiO₄)₃])
 1318-74-7, Kaolinite (Al₂(OH)₄(Si₂O₅)), properties 1318-86-1,
 Margarite (Al₂(Al₂Si₂)Ca[(OH)O_{0.5}-1F₀-0.5]2O₁₀) 1318-94-1,
 Muscovite (Al₂K(Si₃Al)[(OH)O_{0.5}-1F₀-0.5]2O₁₀) 1319-37-5,
 Vesuvianite (Al₄Ca₁₀Mg₂(SiO₄)_{9.2}H₂O) 1319-42-2, Zoisite
 (Ca₂[Al₃(OH)(SiO₄)₃]) 12003-54-2, Jadeite 12023-16-4,
 Magnesioferrite (Mg(FeO₂)₂) 12026-53-8, Paragonite
 (Al₃NaH₂(SiO₄)₃) 12027-58-6, Prehnite (Al₂Ca₂H₂(SiO₄)₃)
 12036-19-0, Thorianite (ThO₂) 12036-23-6, Baddeleyite
 12063-18-2, Ulvoespinel (Fe₂TiO₄) 12135-61-4, Titanite
 (Ca[TiO(SiO₄)]) 12141-45-6, Sillimanite (Al₂O(SiO₄)) 12161-84-1,
 Lizardite (Mg₃H₂(SiO₄)₂.H₂O) 12168-52-4, Ilmenite (FeTiO₃)
 12173-36-3, Gedrite ((Fe_{0.11}-0.9Mg_{0.1}-0.89)₅-6Al₁-2)(Si₆-7Al₁-
 2)(OH)2O₂₂) 12174-08-2, Omphacite 12178-42-6, Hornblende
 12183-80-1, Andalusite (Al₂O(SiO₄)) 12194-71-7, Perovskite
 (Ca(TiO₃)) 12244-10-9, Albite ((Si_{2.9}-3Al₁-1.1)(Na_{0.9}-1Ca₀-0.1)O₈)
 12251-24-0, Kalsilite (AlK(SiO₄)) 12251-27-3, Nepheline
 (AlNa(SiO₄)) 12251-44-4, Orthoclase (K(AlSi₃O₈)) 12252-51-6,
 Spessartine (Al₂Mn₃(SiO₄)₃) 12269-78-2, Pyrophyllite (AlH(SiO₃)₂)
 12305-55-4, Topaz (Al₂F₂(SiO₄)) 12330-27-7, Sanidine (K(AlSi₃O₈))
 12413-43-3, Amesite (Al(AlSi)(Mg_{0.5}-1Fe₀-0.5)₂(OH)₄O₅) 12416-60-3,
 Humite (Mg₇F₂(SiO₄)₃) 12445-80-6, Chloritoid (Al₂FeO₂(SiO₄).H₂O)
 13397-26-7, Calcite (Ca(CO₃)), properties 13462-86-7, Barite
 (Ba(SO₄)) 13598-00-0, Phenakite (Be₂(SiO₄)) 13598-21-5,
 Bromellite (BeO) 13717-00-5, Magnesite (Mg(CO₃)) 13718-72-4,
 Ferrosilite (Fe(SiO₃)) 13778-37-5, Stishovite (SiO₂) 13778-38-6,
 Coesite (SiO₂) 13817-22-6, Xenotime (Y(PO₄)) 13918-37-1,
 Fayalite (Fe₂(SiO₄)) 13983-17-0, Wollastonite (Ca(SiO₃))
 14291-02-2, Celestite (Sr(SO₄)) 14374-77-7, Willemite (Zn₂(SiO₄))
 14457-84-2, Diaspore (Al(OH)O) 14464-46-1, Cristobalite (SiO₂)
 14476-12-1, Rhodochrosite (Mn(CO₃)) 14476-15-4, Cerussite
 (Pb(CO₃)) 14476-16-5, Siderite (Fe(CO₃)) 14483-19-3, Diopside
 (CaMg(SiO₃)₂) 14567-57-8, Rhodonite (CaMn₄(SiO₃)₅) 14567-72-7,
 Uvarovite (Ca₃Cr₂(SiO₄)₃) 14567-73-8, Tremolite
 (Ca₂[(Mg_{0.9}-1Fe₀-0.1)_{4.5}-5Al₀-0.5](Si_{7.5}-8Al₀-0.5)(OH)2O₂₂)
 14567-81-8, Hedenbergite (CaFe(SiO₃)₂) 14567-83-0, Monticellite
 (CaMg(SiO₄)) 14567-85-2, Acmite (FeNa(SiO₃)₂) 14594-79-7,
 Anglesite (Pb(SO₄)) 14681-78-8, Enstatite ((Mg_{0.88}-1Fe₀-0.12)SiO₃)
 14729-96-5, Bustamite (CaMn(SiO₃)₂) 14762-49-3, Gibbsite (Al(OH)₃)

14791-73-2, Aragonite ($\text{Ca}(\text{CO}_3)$) 14798-04-0, Anhydrite ($\text{Ca}(\text{SO}_4)$)
 14807-96-6, Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$), properties 14808-60-7, Quartz
 (SiO_2), properties 14854-26-3, Pyrolusite (MnO_2) 14913-80-5,
 Scheelite ($\text{Ca}(\text{WO}_4)$) 14940-68-2, Zircon ($\text{Zr}(\text{SiO}_4)$) 14941-39-0,
 Witherite ($\text{Ba}(\text{CO}_3)$) 14941-40-3, Strontianite ($\text{Sr}(\text{CO}_3)$)
 14987-02-1, Tephroite ($\text{Mn}_2(\text{SiO}_4)$) 15078-96-3, Andradite
 ($\text{Ca}_3\text{Fe}_2(\text{SiO}_4)_3$) 15118-03-3, Forsterite ($\text{Mg}_2(\text{SiO}_4)$) 15468-32-3,
 Tridymite (SiO_2) 15501-85-6, Thorite ($\text{Th}(\text{SiO}_4)$) 15501-92-5,
 Huebnerite ($\text{W}(\text{MnO}_4)$) 15627-80-2, Kirschsteinite ($\text{CaFe}(\text{SiO}_4)$)
 16322-41-1, Ferberite ($\text{Fe}_2\text{W}_2\text{O}_9$) 16389-88-1, Dolomite ($\text{CaMg}(\text{CO}_3)_2$),
 properties 17068-78-9, Anthophyllite 17125-56-3, Wustite (FeO)
 17499-08-0, Cumingtonite ($(\text{Fe}_{0.31}\text{-}0.7\text{Mg}_{0.3}\text{-}0.69)_7\text{Si}_8(\text{OH})_2\text{O}_{22}$)
 20431-17-8, Zincite (ZnO) 24250-28-0, Annite ($\text{Fe}_4\text{KH}_2(\text{SiO}_4)_3$)
 33247-50-6, Richterite ($\text{CaMg}_5\text{Na}_2\text{H}_2(\text{SiO}_3)_8$) 34492-97-2, Bunsenite
 (NiO) 39427-12-8, Liebenbergite ($\text{Ni}_2(\text{SiO}_4)$) 61076-94-6,
 Phlogopite ($\text{Mg}_3\text{K}(\text{Si}_3\text{Al})[(\text{OH})_0.5\text{-}1\text{F}_{0.5}]\text{O}_{10}$) 61158-91-6,
 Pargasite ($\text{Al}_3\text{Ca}_2\text{Mg}_4\text{NaH}_2(\text{SiO}_4)_6$) 61158-93-8, Glaucophane
 ($\text{Al}_2\text{Mg}_3\text{Na}_2\text{H}_2(\text{SiO}_3)_8$) 63043-12-9, Staurolite
 ($\text{Al}_{10}\text{Fe}_2\text{O}_{11}(\text{SiO}_4)_3\cdot\text{H}_2\text{O}$) 63701-59-7, Melilite ($\text{Ca}_2\text{Mg}(\text{Si}_2\text{O}_7)$)
 64550-75-0, Hafnon ($\text{Hf}(\text{SiO}_4)$) 90582-76-6, Ankerite ($\text{Ca}_2\text{FeMg}(\text{CO}_3)_4$)
 99439-28-8, Quartz-beta (SiO_2)

(oxygen self-diffusion in minerals estd. from anion porosity by
 empirical model for both anhydr. and hydrothermal conditions)

L27 ANSWER 17 OF 36 HCA COPYRIGHT 2004 ACS on STN

90:74526 Phase and structure transformations of muscovite into
 trioctahedral layered silicates. Frank-Kamenetskii, V. A.; Kotov,
 N. V.; Ryumin, A. A. (Leningr. Gos. Univ., Leningrad, USSR). Trudy
 Instituta Geologii i Geofiziki (Novosibirsk), 403, 211-21 (Russian)
 1978. CODEN: TGGSAV. ISSN: 0568-658X.

AB Hydrothermal treatment of muscovite [1318-94-1] in mixts. with
 magnesite and dolomite at H_2O pressure 1000 kg/cm² and
 200-600° for 6-72 h revealed the conditions of synthesis of
 (Mg, Al)-serpentine, phlogopite [12251-58-0], **chlorite**
 [1318-59-8], hexagonal and triclinic anorthite [1302-54-1],
 grossular [1302-57-4], monticellite [14567-83-0], forsterite
 [15118-03-3], **brucite** [1317-43-7], and calcite
 [13397-26-7]. The muscovite transformation was substantially
 controlled by the compn. of the reaction medium; however in all
 cases the 3-layer structure of muscovite is transformed to the
 2-layer structure of (Mg, Al)-serpentine and then to the 3-layer
 structure of phlogopite. Under conditions of rapid temp. increase
 (40°/min) muscovite is directly transformed to phlogopite.
 The Al content in the serpentines is detd. by the total Al content
 in the admixt. and the degree to which the reaction proceeds. The
 possibility is exptl. shown of fractionation of such elements as K
 and Mg in the vapor phase during the hydrothermal transformation.

IT 1317-43-7

(formation conditions of, in muscovite magnesian
hydrothermal transformation)

RN 1317-43-7 HCA

CN Brucite (Mg(OH)₂) (9CI) (CA INDEX NAME)

HO-Mg-OH

CC 53-1 (Mineralogical and Geological Chemistry)

IT Chlorite (the mineral)

Serpentine (the mineral)

(formation conditions of, in muscovite magnesian
hydrothermal transformation)

IT 1302-54-1 1302-57-4 1317-43-7 12251-58-0 13397-26-7,
preparation 14567-83-0 15118-03-3

(formation conditions of, in muscovite magnesian
hydrothermal transformation)

L27 ANSWER 24 OF 36 HCA COPYRIGHT 2004 ACS on STN

75:155683 Formation of lamellar silicates during phase and structural
transformations of dioctahedral montmorillonite under pressure.
Kotov, N. V.; Shitov, V. A. (USSR). Vestnik Leningradskogo
Universiteta, Seriya 7: Geologiya, Geografiya (2), 34-47 (Russian)
1971. CODEN: VELUA2. ISSN: 0024-0834.

AB Hydrothermal expts. were carried out on dioctahedral montmorillonite
(from Ascangel in Georgia) at 100-700° at a H₂O pressure of
2000 kg/cm² during 1-70 days. The original montmorillonite
contained: SiO₂ 50.92, Al₂O₃ 17.19, Fe₂O₃ 2.80, MgO 4.10,
CaO 2.60, Na₂O 0.72, K₂O 0.86, H₂O 13.00 wt. %. Trioctahedral
montmorillonite, 14 Å chlorite, and mixed-layer
minerals were synthesized. A general trend in montmorillonite
structural changes due to temp. increase, lengthening of exposure,
and to the presence of alkali was obsd. Short exposure is likely to
have precluded a low rate of formation of a brucite layer
in chlorite. The chlorite structure was formed
gradually through intermediate mixed-layer structures. High PT
stability of montmorillonite is discussed, and a review of the
possible phase and structural transformations of montmorillonite
treated under hydrostatic pressures is given.

CC 70 (Crystallization and Crystal Structure)

L27 ANSWER 27 OF 36 HCA COPYRIGHT 2004 ACS on STN

65:19395 Original Reference No. 65:3570b-d Chemical constitution and
correlation of optical properties with the chemical composition of
chlorites by statistical correlation analysis. Il'vitskii,
M. M.; Tanatar-Barash, Z. I. (State Univ., Dnepropetrovsk). Zapiski
Vserossiiskogo Mineralogicheskogo Obshchestva, 95(2), 224-9
(Russian) 1966. CODEN: ZVMOEK. ISSN: 0869-6055.

AB Statistical analysis of the compn. of **chlorites** substantiated the hypothesis of the presence of 2 types of isomorphous replacement in **chlorites**: isovalent and heterovalent. The isovalent isomorphism of octahedral cations was detected in talc and **brucite** layers and consisted of the replacement of bivalent Mg by bivalent Fe (coeff. of correlation $r_{Fe^{2+}/O\ Mg/O} = -0.657$). After exclusion of **chlorite** of sedimentary genesis, the correlation coeff. increased from -0.657 to -0.831. The heterovalent isomorphism consisted in the replacement of cations of various valences from octahedral positions of **brucite** and talc layers. During this isomorphism, bivalent Mg was replaced by trivalent Al ($r_{Mg/O\ Al/O} = -0.376$) and Fe ($r_{Mg/O\ Fe^{3+}/O} = -0.456$). The value of n (γ) was strongly affected by the pos. effect of Fe^{2+}/O ($r_{\gamma Fe^{2+}/O} = 0.951$) and strong neg. effect of Mg/O ($r_{\gamma Mg/O} = 0.890$). The regression equation for $\gamma_{Fe^{2+}/O}$ and Mg/O was calcd. as: $Fe^{2+}/O = 7.26\ \gamma - 11.47$ and $Mg/O = 6.596 - 3.93\ \gamma$. In practice it is necessary to det. contents of FeO and **MgO** and express them through the O ratios of Fe^{2+}/O and Mg/O ; $FeO = 0.428 + 54.8\ Fe^{2+}/O$ and $MgO = 86.0\ Mg/O - 1.02$.

IT 14998-27-7, **Chlorite**
(optical properties of, compn. effect on)
RN 14998-27-7 HCA
CN Chlorite (8CI, 9CI) (CA INDEX NAME)

$O \equiv Cl - O^-$

CC 25 (Mineralogical and Geological Chemistry)
IT 14998-27-7, **Chlorite**
(optical properties of, compn. effect on)

L27 ANSWER 35 OF 36 HCA COPYRIGHT 2004 ACS on STN

44:27102 Original Reference No. 44:5273g-i X-ray study of thermal transformations in some **magnesian chlorite** minerals. Brindley, G. W.; Ali, Z. Sultana (Univ., Leeds, UK). Acta Cryst., 3, 25-30 (Unavailable) 1950.

AB The first stage of dehydration of **magnesian chlorites** is shown to involve the removal of water from the **brucite** layer. Movement of the Mg atoms from their original positions is indicated by the results of Fourier analysis. The second stage of dehydration is followed by the formation of olivine. The orientation of the olivine relative to the **chlorite** structure and the movements of the atoms in the transformation are discussed. These reactions proceed at somewhat higher temperatures as one goes from penninite to clinocllore to sheridanite. Spinel and probably enstatite appear when the heating is continued to still higher temps. Curves obtained by the method of differential thermal

analysis show endothermic peaks corresponding to the dehydration processes and an exothermic peak corresponding to the formation of olivine. They exhibit, however, a greater variety of results than the x-ray measurements, and the latter provide no immediate explanation of certain features of these curves.

IT 1317-43-7, Brucite
(dehydration of, x-ray study of)
RN 1317-43-7 HCA
CN Brucite (Mg(OH)₂) (9CI) (CA INDEX NAME)

HO—Mg—OH

IT 14998-27-7, Chlorite
(magnesian, x-ray study of thermal transformations in
minerals of)
RN 14998-27-7 HCA
CN Chlorite (8CI, 9CI) (CA INDEX NAME)

O=Cl—O⁻

CC 8 (Mineralogical and Geological Chemistry)
IT Olivine
(formation of, in dehydration of magnesian
chlorites, x-ray study of)
IT Minerals
(magnesian chlorite, x-ray study of thermal
transformations in)
IT Dehydration (chemical)
(of magnesian chlorite minerals)
IT 1317-43-7, Brucite
(dehydration of, x-ray study of)
IT 1302-67-6, Spinel 14681-78-8, Enstatite
(formation of, in dehydration of magnesian
chlorite minerals)
IT 14998-27-7, Chlorite
(magnesian, x-ray study of thermal transformations in
minerals of)

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L28 ANSWER 1 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Phyllosilicate minerals in the hydrothermal
mafic-ultramafic-hosted massive-sulfide deposit of Ivanovka
(southern Urals): comparison with modern ocean seafloor analogues

- L28 ANSWER 2 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI A reappraisal of episodic burial metamorphism in the Andes of central Chile
- L28 ANSWER 3 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Transmission electron microscopy study of very low-grade metamorphic evolution in Neoproterozoic pelites of the Puncoviscana formation (Cordillera Oriental, NW Argentina)
- L28 ANSWER 4 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Technology and composition of Roman pottery in northwestern Peloponnese, Greece
- L28 ANSWER 5 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Textural and chemical changes in slate-forming **phyllosilicates** across the external-internal zones transition in the low-grade metamorphic belt of the NW Iberian Variscan Chain
- L28 ANSWER 6 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Borocookeite, a new member of the **chlorite** group from the Malkhan gem tourmaline deposit, Central Transbaikalia, Russia
- L28 ANSWER 7 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Metamorphic **chlorite** and "vermiculitic" phases in mafic dikes from the Malaguide Complex (Betic Cordillera, Spain)
- L28 ANSWER 8 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Mineralogy and origin of spots in spotted slate from the Malaguide Complex, Betic Cordilleras, Spain: an XRD, EMPA and TEM-AEM study
- L28 ANSWER 9 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Luzenac talcs in ceramics: better product performance and easier fast firing
- L28 ANSWER 10 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI The **phyllosilicates** in diagenetic-metamorphic rocks of the south Portuguese zone, southwestern Portugal
- L28 ANSWER 11 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Alteration of felsic volcanics hosting the Thalanga massive sulfide deposit (Northern Queensland, Australia) and geochemical proximity indicators to ore
- L28 ANSWER 12 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Mineralogy and geochemistry of herbalist's clays for internal use: simulation of the digestive process

- L28 ANSWER 13 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI **Phyllosilicates** from hydrothermally altered granitoid rocks in the Pezinok Sb-Au deposit, western Carpathians, Slovakia
- L28 ANSWER 14 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Comparison of evolution of trioctahedral **chlorite** /berthierine/smectite in coeval metabasites and metapelites from diagenetic to epizonal grades
- L28 ANSWER 15 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Exhumation paths of high-pressure metapelites obtained from local equilibria for **chlorite**-phengite assemblages
- L28 ANSWER 16 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI The stones of medieval buildings in Pisa and Lucca (western Tuscany, Italy). 3 - green and white-pink quartzites from Mt. Pisano
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TI Reactions leading to the formation and breakdown of stilpnomelane in the Otago Schist, New Zealand
- L28 ANSWER 18 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Effects of terrestrial weathering on the matrix mineralogy of Colony CO3 chondrite
- L28 ANSWER 19 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Hydrothermal synthesis of corrensite: a study of the transformation of saponite to corrensite
- L28 ANSWER 20 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Metamorphic evolution from diagenesis to epizone in Cambrian formations from NW Zafra (Ossa-Morena zone, SW Spain)
- L28 ANSWER 21 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Chemostratigraphic, alteration, and oxygen isotopic trends in a profile through the stratigraphic sequence hosting the Heath Steele B zone massive sulfide deposit, New Brunswick
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TI Alpidic formation of leucophyllite at the eastern margin of the Alps
- L28 ANSWER 24 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Microstructures of intergrown **phyllosilicate** grains from Verrucano metasediments (northern Apennines, Italy)

- L28 ANSWER 25 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Genesis and controls of hydrothermal dolomitization in sandstones of the Appalachian thrust belt, Quebec, Canada: Implications for associated galena-barite mineralization
- L28 ANSWER 26 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Genesis and transformation of dickite in Permo-Triassic sediments (Betic Cordilleras, Spain)
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TI Preservation of clay minerals in the Precambrian (1.1 Ga) Nonesuch Formation in the vicinity of the White Pine copper mine, Michigan
- L28 ANSWER 28 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI **Chlorites** in a spectrum of igneous rocks: mineral chemistry and paragenesis
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TI The amphibolite-eclogite transformation: An experimental study on basalt
- L28 ANSWER 30 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Preliminary mineral chemical studies of **phyllosilicates** in host rocks of the Kidd Creek massive sulfide deposit, Timmins, Ontario
- L28 ANSWER 31 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Mineralogy, geochemistry, and metamorphism of the Early Proterozoic Vahajoki iron ores, northern Finland
- L28 ANSWER 32 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Experimental study of the stability of sudoite and magnesiocarpholite and calculation of a new petrogenetic grid for the system ferrous oxide-magnesium oxide -alumina-silica-water
- L28 ANSWER 33 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI The characterization of mafic **phyllosilicates** in low-grade metabasalts from eastern North Greenland
- L28 ANSWER 34 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Formation conditions of variable-composition micas and **chlorites** during metasomatic processes
- L28 ANSWER 35 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI The composition of **phyllosilicates** in Precambrian, low-grade-metamorphic, clastic rocks from the Southern Hesperian

Massif (Spain) used as an indicator to metamorphic conditions

- L28 ANSWER 36 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Synthetic allophane and layer-silicate formation in silica-alumina-iron(2+) oxide-iron(3+) oxide-magnesia-water systems at 23°C and 89°C in a calcareous environment
- L28 ANSWER 37 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Metamorphic olivine in picritic metavolcanics from southern Finland
- L28 ANSWER 38 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Chemistry of micas and **chlorite** in Proterozoic acid metavolcanics and associated rocks from the Haastefault area, Norberg Ore District, central Sweden
- L28 ANSWER 39 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Mineral stability in soils developed from basic and ultrabasic rocks of Galicia (Spain)
- L28 ANSWER 40 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Activity diagrams for the **magnesium oxide**-sodium oxide-potassium oxide-silica-alumina-water-hydrogen chloride system in the temperature range 298 to 623 K and 1 bar pressure: application to the 1900 Ma phlogopite-magnesium-**chlorite**-sericite schists of W. Bergslagen, Sweden
- L28 ANSWER 41 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Mineral and whole-rock compositions of seawater-dominated hydrothermal alteration at the Arctic volcanogenic massive sulfide prospect, Alaska
- L28 ANSWER 42 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Alteration of aluminum-rich inclusions inside amoeboid olivine aggregates in the Allende meteorite
- L28 ANSWER 43 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Transformations of schistose material in the presence of gold and silver and the behavior of some elements under hydrothermal conditions at elevated P-T [pressure-temperature] parameters
- L28 ANSWER 44 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Tschermak substitution in low- and middle-grade pelitic schists
- L28 ANSWER 45 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Alteration of chondrules and matrices in the four Antarctic carbonaceous chondrites ALH-77307(C3), Y-790123(C2), Y-75293(C2), and Y-74662(C2)

- L28 ANSWER 46 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Physical arrangement of high-alumina clay types in a Missouri clay deposit and implications for their genesis
- L28 ANSWER 47 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Genesis and properties of soil derived from serpentinites in Lower Silesia. IV. Characteristics of the colloidal fraction
- L28 ANSWER 48 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI The composition of **chlorites** in a propylitized syenite near Ceyssat, Puy-de-Dome, France
- L28 ANSWER 49 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Low-grade metapelites in the contact metamorphic aureole around the Tono granodiorite pluton, Miyamori-Ohazama district, Kitakami Mountains
- L28 ANSWER 50 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Very low grade metamorphism of Triassic volcanics, West Hellenic nappes, southern Peloponnese, Greece
- L28 ANSWER 51 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Talc-muscovite: synthesis of a new high-pressure **phyllosilicate** assemblage
- L28 ANSWER 52 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI A talc-phengite assemblage in piemontite schist from Brezovica, Serbia, Yugoslavia
- L28 ANSWER 53 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Nondetrital siliceous rocks from the northcentral Apennines. Two jasper formations belonging to the allochthonous ophiolites and a jasper formation associated with the metamorphic Toscana series
- L28 ANSWER 54 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Sequence of subfacies of the greenschist facies in the middle Cevennes (Dep. Ardeche, France) with pyrophyllite-bearing parageneses
- L28 ANSWER 55 OF 55 HCA COPYRIGHT 2004 ACS on STN
TI Preliminary note on a new dioctahedral **phyllosilicate** of the **chlorite** group

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FILE LAST UPDATED: 2 Sep 2004 (20040902/ED)

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=> d 128 9,28,34,51,55 cbib abs hitstr hitind

L28 ANSWER 9 OF 55 HCA COPYRIGHT 2004 ACS on STN
136:313572 Luzenac talcs in ceramics: better product performance and easier fast firing. Grosjean, P. (Luzenac Europe, Toulouse, 31036, Fr.). Prace Komisji Nauk Ceramicznych, Ceramika (Polska Akademia Nauk), 60(Polska Ceramika 2000), 63-68 (English) 2000. CODEN: PKNCE6. ISSN: 0860-3340. Publisher: Polskie Towarzystwo Ceramiczne.

AB A review. Talc is a natural mineral **phyllosilicate** and part of the clay family. It is often found in assocn. with **chlorites** and carbonates. In building ceramics, talc facilitates the fast firing of stoneware tiles, notably while and pale porcellanato. The flatness and delayed crazing resistance of large-format monoporous or twice fast-fired wall tiles are improved with talc. Low iron content talcs are used in glazes, frits and engobes for their **MgO** contribution. **Chlorite**

-rich talc is a major component for the cordierite synthesis of kiln furniture refractories. Very pure, micro-cryst. talcs, known as soapstone, are used in steatite electro-ceramic prodn. Several std. formulations are provided in this paper, together with their performances.

CC 57-0 (Ceramics)

L28 ANSWER 28 OF 55 HCA COPYRIGHT 2004 ACS on STN

122:270180 **Chlorites** in a spectrum of igneous rocks: mineral chemistry and paragenesis. Abdel-Rahman, Abdel-Fattah M. (Dep. Geology, Concordia Univ., Montreal, QC, H4B 1R6, Can.). Mineralogical Magazine, 59(394), 129-41 (English) 1995. CODEN: MNLMBB. ISSN: 0026-461X. Publisher: Mineralogical Society.

AB The **chlorite** data presented are from four igneous complexes covering the compositional spectrum of igneous rocks (gabbro to granite) of orogenic and anorogenic settings. The four igneous complexes are (1) early orogenic gabbro-diorite-tonalite (D-T) suite, (2) late orogenic granodiorite-adamellite (G-A) suite (both are calc-alk. suites), (3) high-alumina trondhjemite (TR), and (4) anorogenic peralkaline granite (PGR). **Chlorites** in these igneous rocks show characteristic compositional fields. The Mg vs Fe plot provides the best discriminant, as data points define three compositionally different groups. Phases in the PGR are Fe-rich, siliceous, interlayered **chlorite-smectite** (Fe/Mg = 8.6), and differ significantly from those in the calc-alk. D-T and G-A rocks which are Mg-rich **chlorites** (Fe/Mg = 0.6-0.8). The x-ray diffraction data for the peralkaline granite samples show superlattice reflections at approx. 31 Å (air-dried) and 34 Å (ethylene glycollated), thus suggesting the presence of an expandable (smectite-like) component in this interlayered (**chlorite-smectite**) **phyllosilicate** phase. **Chlorites** in the peraluminous TR rocks contain Fe/Mg values intermediate between the other two types (Fe/Mg = 1.3). Tetrahedral Al (Al_T) values are remarkably low (0-0.5) in **phyllosilicates** in the PGR, but vary from 1.9-2.5 in **chlorites** from the other suites. Yet, these **chlorite** groups with their generally low Al_T values are distinct from the more stable (type IIb) metamorphic **chlorites**. Sedimentary **chlorites** are somewhat similar, in their low Al_T values and metastable structural type, to **chlorites** in igneous rocks. In the calc-alk. rocks, **chlorite** may have been formed at the expense of both biotite [biotite + 3M + 3H₂O = **chlorite** + A], and calcic amphibole [2 Ca-amphibole + 6H₂O + 5O₂ + 1.8Al = 1 **chlorite** + 8SiO₂ + A], where M = Fe, Mg, Al, and A = K, Na, Ca. The alteration of alkali amphibole in the peralkaline rocks may have produced interlayered **chlorite-smectite** via this reaction; [1 Na-amphibole + 7H₂O + 2.5O₂ + M = 1 **chlorite-smectite** +

A]. The presence of such interlayered **chlorite**-smectite which typically form at low T (150-200°C) suggests that the region was not affected by any major reheating events, which is consistent with the nature of the feldspars.

CC 53-1 (Mineralogical and Geological Chemistry)

ST **chlorite** igneous rock paragenesis Egypt

IT Adamellite

Diorite

Gabbro

Granite, processes

Granodiorite

Tonalite

Trondhjemite

(mineral chem. and paragenesis of **chlorites** from different igneous rocks of Egypt)

IT **Chlorite**-group minerals

(mineral compn.; as indicator of paragenesis of **chlorites** from different igneous rocks of Egypt)

IT 12174-47-9, Ferroan clinocllore 12414-36-7, **Magnesian** chamosite 12421-05-5, Pycnochlorite

(mineral compn.; as indicator of paragenesis of **chlorites** from different igneous rocks of Egypt)

L28 ANSWER 34 OF 55 HCA COPYRIGHT 2004 ACS on STN

117:216379 Formation conditions of variable-composition micas and **chlorites** during metasomatic processes. Kol'tsov, A. B. (St. Petersburg Gos. Univ., St. Petersburg, Russia). Geokhimiya (6), 846-57 (Russian) 1992. CODEN: GEOKAQ. ISSN: 0016-7525.

AB Micas and **chlorites** are considered in the system K₂O-MgO-Al₂O₃-SiO₂-H₂O as solid soln. series muscovite-phengite, phlogopite-eastonite, and clinichlore-amesite. Thermodyn. consts. of end-members are derived on the basis of compns. of coexisting minerals from metamorphic and metasomatic rocks and synthetic phases. A quant. diagram showing stability fields of assocns. with muscovite, biotite and **chlorite** in excess of quartz is proposed. The compns. of coexisting minerals is detd. in every point of this diagram. Coexisting micas and **chlorites** appear to be sensitive indicators of fluid alky. The data obtained give evidence that the metasomatic processes were characterized in many cases by slight variations of alky. owing to the buffering influence of rock-forming assocns.

IT 1309-48-4, **Magnesium oxide** (MgO), properties

(systems, alumina-magnesia-silica-water-, equil. and stability of **phyllosilicate** minerals in)

RN 1309-48-4 HCA

CN **Magnesium oxide** (MgO) (9CI) (CA INDEX NAME)

Mg=O

- CC 53-1 (Mineralogical and Geological Chemistry)
- ST mica **chlorite** solid soln thermodyn modeling; layered silicate stability thermodyn const metasomatism
- IT Geological hydrothermal fluids
(metasomatic, equil. and stability of micas and **chlorites** in, estn. of thermodyn. consts. for, modeling in relation to)
- IT Free energy
(of formation, of **chlorites** and micas)
- IT 1318-94-1, Muscovite 12174-17-3, Phengite 61076-94-6, Phlogopite
(equil. and stability of, coexisting with **chlorite**, in metasomatic fluid, thermodyn. modeling in relation to)
- IT 7631-86-9, Silica, properties
(systems, alumina-magnesia-potassium oxide-water-, equil. and stability of **phyllosilicate** minerals in)
- IT 1309-48-4, Magnesium oxide (MgO), properties 12136-45-7, Potassium oxide (K₂O), properties
(systems, alumina-magnesia-silica-water-, equil. and stability of **phyllosilicate** minerals in)
- IT 1344-28-1, Aluminum oxide (Al₂O₃), properties
(systems, **magnesia**-potassium oxide-silica-water-, equil. and stability of **phyllosilicate** minerals in)

L28 ANSWER 51 OF 55 HCA COPYRIGHT 2004 ACS on STN

88:64174 Talc-muscovite: synthesis of a new high-pressure **phyllosilicate** assemblage. Schreyer, W.; Baller, T. (Inst. Mineral., Ruhr-Univ., Bochum, Fed. Rep. Ger.). Neues Jahrbuch fuer Mineralogie, Monatshefte (9), 421-5 (English) 1977. CODEN: NJMMAW. ISSN: 0028-3649.

- AB High-pressure experimentation in the model system K₂O-MgO-Al₂O₃-SiO₂-H₂O showed that the novel **phyllosilicate** assemblage talc-phengitic muscovite recently detected in a rock from Yugoslavia is characteristic of water pressures in excess of some 11 kbar and relatively low temps. (<660°). It substitutes for mineral pairs such as phlogopite-**chlorite** or phlogopite-Al₂SiO₅ usually occurring in natural rocks.
- CC 53-1 (Mineralogical and Geological Chemistry)

L28 ANSWER 55 OF 55 HCA COPYRIGHT 2004 ACS on STN

55:92441 Original Reference No. 55:17385b-e Preliminary note on a new dioctahedral **phyllosilicate** of the **chlorite** group. Muller, German (Univ. Tübingen, Germany). Neues Jahrbuch fuer Mineralogie, Monatshefte 112-20 (Unavailable) 1961. CODEN: NJMMAW. ISSN: 0028-3649.

- AB Spherical to lens-shaped aggregates of soft yellowish to grayish material occur in hydrothermally altered Permian quartz porphyries

near Triberg, Black Forest. X-ray study showed the presence of quartz, hydromuscovite (1M), and a **chlorite** with a 5.14, b 8.95, d001 14.22 ± 0.04 Å. The **chlorite** is optically neg., 2 V small, $n_s \alpha 1.574 \pm 0.003$, β .apprx. γ 1.580 ± 0.002 . Analysis gave SiO₂ 45.93, Al₂O₃ 35.33, FeO trace, CaO, MgO, Na₂O none, K₂O 3.95, H₂O - 2.27, H₂O+ 8.73, sum 99.75%. After deducting hydromuscovite, Fe₂O₃, and 2% quartz, this corresponds to Al₂Si₄O₁₀(OH)₂.Al₂(OH)₆, i.e. to a **chlorite** with alternating pyrophyllite and gibbsite layers. Heating at 750-800° gave pyrophyllite, which disappeared above 850°; mullite was formed above 1000°. Treatment with ethylene glycol and boiling in solns. contg. K⁺ or NH₄⁺ had no effect. The relations to cookeite, manandonite, and other **chlorites** are discussed.

- CC 8 (Mineralogical and Geological Chemistry)
 IT **Chlorite-group minerals**
 (diocahedral, of Triberg, Black Forest and its alteration)
 IT 12269-78-2, Pyrophyllite
 (alternating layers with gibbsite, as new **chlorite** of
 Triberg, Black Forest)
 IT 14762-49-3, Gibbsite
 (alternating layers with pyrophyllite, as new **chlorite**
 of Triberg, Black Forest)
 IT 1302-93-8, Mullite
 (formation of, in heating of gibbsite-pyrophyllite mixedlayer
 chlorite)

=>

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FILE 'HCAPLUS' ENTERED AT 09:40:18 ON 09 SEP 2004

L1 2272 SEA ALBERS ?/AU
L2 77 SEA BURKHEAD ?/AU
L3 8 SEA L1 AND L2
L4 23984 SEA CHLORITE#
L5 2 SEA L3 AND L4
L6 54169 SEA MAGNESIA#
L7 2 SEA L3 AND L6
L8 1779240 SEA SCRUB? OR SORB? OR SORP? OR ABSORB? OR ABSORP? OR
ADSORP? OR ADSORB? OR CHEMISORB? OR CHEMISORP? OR
CHEMICOSORB? OR CHEMICOSORP?

FILE 'REGISTRY' ENTERED AT 09:58:44 ON 09 SEP 2004

L9 1 SEA 1309-48-4
L10 1 SEA 12304-65-3
L11 1 SEA 14998-27-7
E BRUCITE/CN
L12 1 SEA BRUCITE/CN
E PHYLLOSILICATE/CN
E PHYLLOSILICATE
L13 1 SEA PHYLLOSILICATE/BI

FILE 'HCA' ENTERED AT 10:14:53 ON 09 SEP 2004

L14 178558 SEA L9 OR (MAGNESIUM# OR MG) (W) (OXIDE# OR MONOXIDE#) OR
MAGNESIA# OR MGO
L15 4206 SEA L10 OR HYDROTALCITE#
L16 23878 SEA L11 OR CHLORITE#
L17 2250 SEA L12 OR BRUCITE#
L18 2507 SEA L13 OR PHYLLOSILICATE# OR PHYLLO(2A)SILICATE#
L19 2125 SEA L14 AND L16
L20 45 SEA L19 AND L17
L21 63 SEA L19 AND L18
L22 2 SEA L19 AND L17 AND L18
L23 7 SEA L20 AND L8
L24 6 SEA L21 AND L8
L25 6 SEA L14 AND L16 AND L15
L26 15 SEA L22 OR L23 OR L24
L27 36 SEA L20 NOT L26

L28 55 SEA L21 NOT (L26 OR L27)

=> file hca

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L25 ANSWER 1 OF 6 HCA COPYRIGHT 2004 ACS on STN

135:94963 Rheology-modified clays for viscoplastic fluid loss modifiers for aqueous drilling and mining fluids. Hoy, Edgar Franklin (USA).

PCT Int. Appl. WO 2001049406 A1 20010712, 45 pp. DESIGNATED STATES:

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2.

APPLICATION: WO 2001-US276 20010105. PRIORITY: US 2000-478425 20000106.

AB A rheol.-modified aq. compn., suitable for use in drilling fluids, or as additives in milling and mining applications, consists of mixing water with a clay and an additive of general formula $M'mM''n(OH)(2m+3n+qa+br)(Aq)a(Br)b \cdot xH_2O$ (I). In I, M' is one or more divalent metal cations; m = 0-8; M'' is one or more trivalent metal cations; n = 0-6; A is a polyvalent or monovalent anion or anion radical; a is an amt. of A ions of valence q, provided that if A is monovalent, a = 0-8, and if A is polyvalent, a = 0-4; B is a second polyvalent or monovalent anion or anion radical; b is an amt. of B ions of valence r, and b = 0-4; m + n \geq 1; qa + br < 2m + 3n and qa cannot equal 2m + 3n; (2m + 3n + qa + br) < 3, and; xH₂O are excess waters of hydration in which x > 0. Calcined **hydrotalcite** and **hydrotalcite**-like materials are particularly preferred as starting materials. Optionally, an aluminum oxide, a nitrogen-contg. compd., or both may be added. The resulting compn. is preferably an elastic solid exhibiting stress-dependent fluidity, desirable temp. resistance, inhibition of reactivity, relatively low cost, and pressure resistance. A dry compn. and method of making such compns. are also disclosed.

IT 1309-48-4, Magnesium oxide, uses

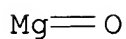
12304-65-3, Hydrotalcite

(drilling fluids contg.; rheol.-modified clays for viscoplastic

fluid loss modifiers for aq. drilling and mining fluids)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



RN 12304-65-3 HCA

CN Hydrotalcite (Mg₆(CO₃)[Al(OH)₆]₂(OH)₄·4H₂O) (9CI) (CA INDEX NAME)

CM 1

CRN 11097-59-9

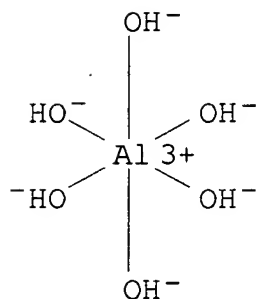
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CM 2

CRN 18893-33-9

CMF Al H6 O6

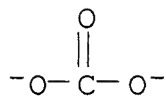
CCI CCS



CM 3

CRN 3812-32-6

CMF C O3



IC ICM B01J013-00

ICS C01B033-20; C04B033-04

CC 51-2 (Fossil Fuels, Derivatives, and Related Products)

ST fluid loss additive drilling; hydrotalcite fluid loss additive; well treatment fluid loss additive; clay modified fluid

loss additive drilling; bentonite modified fluid loss additive drilling; alumina modified fluid loss additive drilling

IT **Chlorite-group minerals**

(clays, drilling fluids contg.; rheol.-modified clays for viscoplastic fluid loss modifiers for aq. drilling and mining fluids)

IT 57-13-6, Urea, uses 60-35-5, Acetamide, uses 62-56-6, Thiourea, uses 79-05-0, Propionamide 497-19-8, Sodium carbonate, uses 1302-42-7, Sodium aluminate (NaAlO_2) 1305-62-0, Calcium hydroxide, uses 1309-42-8, Magnesium hydroxide 1309-48-4, **Magnesium oxide**, uses 1310-73-2, Sodium hydroxide, uses 1318-00-9, Vermiculite 1333-84-2, Aluminum oxide (Al_2O_3), hydrate 1344-28-1, Aluminum oxide (Al_2O_3), uses 7429-90-5D, Aluminum, inorg. compds., uses 7439-89-6D, Iron, inorg. compds., uses 7439-95-4D, Magnesium, inorg. compds., uses 7439-96-5D, Manganese, inorg. compds., uses 7440-02-0D, Nickel, inorg. compds., uses 7440-48-4D, Cobalt, inorg. compds., uses 7440-50-8D, Copper, inorg. compds., uses 7440-55-3D, Gallium, inorg. compds., uses 7440-66-6D, Zinc, inorg. compds., uses 7440-70-2D, Calcium, inorg. compds., uses 9057-06-1, Carboxymethylstarch 12304-65-3, **Hydrotalcite** 18624-44-7, Ferrous hydroxide ($\text{Fe}(\text{OH})_2$) 24551-51-7, Carbonic acid disodium salt, hydrate 24623-77-6, Aluminum oxide hydroxide 26368-58-1, Magnesium hydroxide ($\text{Mg}(\text{OH})_2$), hydrate 50599-28-5, Iron hydroxide ($\text{Fe}(\text{OH})_2$), hydrate 63800-37-3, Sepiolite (drilling fluids contg.; rheol.-modified clays for viscoplastic fluid loss modifiers for aq. drilling and mining fluids)

L25 ANSWER 2 OF 6 HCA COPYRIGHT 2004 ACS on STN

128:129881 Multistep porosity development in clinochlore upon heating. Villieras, F.; Yvon, J.; Francois, M.; Gerard, G.; Cases, J. M. (Laboratoire Environnement et Mineralurgie, INPL and URA 235 CNRS, Ecole Nationale Supérieure de Géologie, Vandœuvre les Nancy, 54 501, Fr.). Special Publication - Royal Society of Chemistry, 213(Characterisation of Porous Solids IV), 588-595 (English) 1997. CODEN: SROCD0. ISSN: 0260-6291. Publisher: Royal Society of Chemistry.

AB Clinochlore is a **magnesian trioctahedral chlorite**

. It is referred to a 2:2 clay mineral due to the regular stacking of 2:1 talc-like layers and Al-Mg **hydrotalcite**-like interlayer octahedral sheets. The structural hydroxyls of the octahedral sheets dehydroxylate around 500°. This reaction generates a microporous maze between the 2:1 sheets. Accessibility of micropores to argon and water vapor is low due to the bad connectivity of the microporous network and the small width between 2:1 layers. The microporous network collapses around 750° due to the dehydroxylation of 2:1 units. The subsequent recrystn. is obsd. from 800° to 1100°. This process generates

mesopores due to ionic diffusion from some regions of the particles to other regions in which high temp. phases are growing.

CC 49-4 (Industrial Inorganic Chemicals)

Section cross-reference(s): 66

L25 ANSWER 3 OF 6 HCA COPYRIGHT 2004 ACS on STN

109:132320 Experimental investigations on the progressive metamorphism of salt-clays. Preuschoff, M.; Lohse, H. H.; Schuermann, K. (Inst. Miner., Petrol. Kristallogr., Philipps-Univ., Marburg, D-3550, Fed. Rep. Ger.). Chemie der Erde, 48(2), 113-30 (German) 1988. CODEN: CERDAA. ISSN: 0009-2819.

AB Exptl. metamorphism of salt-clays was studied using a salt-clay from Bad Salzdetfurth (West Germany). The system **MgO**-**Al₂O₃**-**SiO₂**-**H₂O** was mainly used to det. the newly formed phases. Meta-salt-clays can be characterized by very Mg-rich, Fe-poor parageneses; esp. at higher metamorphic grades, rocks form which are quite different from other metapelites. Up to the medium low-grade metamorphism, metamorphic salt-clays appear in a very uniform paragenesis: muscovite/phengite + clinochlore + quartz + tourmaline + pyrite. The upper part of low-grade metamorphism is characterized by the paragenesis: clinochlore + cordierite + quartz. High-grade metamorphism of a salt-clay gives cordierite + talc (+ quartz). Metamorphism of salt-clays produce a fluid phase which is very rich in alk. solns. and **chlorites**; its acidity will be very high, esp. at higher metamorphic grades. At low temp., the reaction of chlormanasseite with quartz to clinochlore (and alumoserpentine) was obsd.; this reaction may be of special interest: (1) as an explanation of the formation and occurrence of **chlorites** in salt-clays; and (2) this reaction or one very similar may represent a universal principle which leads to the formation of sheet-silicates (e.g. **chlorites**) from non-silicates in other rocks, if the close crystal-chem. relations among chlormanasseite, manasseite, and **hydrotalcite** are considered.

CC 53-4 (Mineralogical and Geological Chemistry)

IT Feldspar-group minerals

Serpentine-group minerals

Tourmaline-group minerals

Chlorite-group minerals

(formation of, by hydrothermal metamorphism of salt-clays)

L25 ANSWER 4 OF 6 HCA COPYRIGHT 2004 ACS on STN

102:9851 New data on the composition of non-ore microinclusions in magnetites from Angara-Ilim iron ore deposits. Vorontsov, A. E.; Amirzhanov, A. A.; Solomonova, L. A.; Romanenko, I. M. (Inst. Geokhim. im. Vinogradova, Irkutsk, USSR). Doklady Akademii Nauk SSSR, 278(1), 193-7 [Mineral.] (Russian) 1984. CODEN: DANKAS. ISSN: 0002-3264.

AB Based on electron microprobe analyses, the chem. compn. was detd. of non-ore microinclusions (MI) in samples of magnetite [1309-38-2] from the Angara-Ilim Fe ore deposits. Nine groups of MI are distinguished, differing in their Mg content and the ratio of other elements. The NI include olivines, clinopyroxenes of diopside-hedenbergite series, **chlorites**, monticellite, pyroaurite, manassaite, **hydrotalcite**, antigorite, talc, etc. Magnetites with a high content of **Mg oxide** and silicate MI have a high concn. of **MgO**.

IT 12304-65-3

(in microinclusions in magnetite from iron ore deposits, of Angara-Ilim, USSR)

RN 12304-65-3 HCA

CN Hydrotalcite (Mg₆(CO₃)[Al(OH)₆]₂(OH)₄·4H₂O) (9CI) (CA INDEX NAME)

CM 1

CRN 11097-59-9

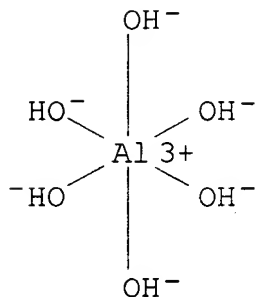
CMF C O3 . 2 Al H6 O6 . 4 H O . 6 Mg

CM 2

CRN 18893-33-9

CMF Al H6 O6

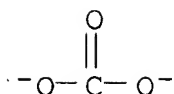
CCI CCS



CM 3

CRN 3812-32-6

CMF C O3



CC 53-1 (Mineralogical and Geological Chemistry)

IT **Chlorite**-group minerals

Olivine-group minerals

(in microinclusions in magnetite from iron ore deposits, of Angara-Ilim, USSR)

IT 12304-65-3 12351-90-5 12351-92-7 14567-83-0

14807-96-6, occurrence 61076-98-0

(in microinclusions in magnetite from iron ore deposits, of Angara-Ilim, USSR)

L25 ANSWER 5 OF 6 HCA COPYRIGHT 2004 ACS on STN

96:184668 Authigenic silicate mineral formation of various salinization stages (as illustrated by the Permian basins of the southeastern Russian platform). Sokolova, T. N. (Geol. Inst., Moscow, USSR). Trudy - Akademiya Nauk SSSR, Geologicheskii Institut, 361, 164 pp. (Russian) 1982. CODEN: TGEIAP. ISSN: 0002-3272.

AB The formation is considered of authigenic clay minerals during the successive stages of increase in water salinity in the Permian evaporite basins of the southeastern Russian Platform. The assocn. **magnesian chlorite**-corrensite-ferroan illite is characteristic for the 1st (dolomite-sulfate) stage. **Magnesian chlorite** and ferroan illite are mineral indicators of the 2nd (halite) stage. The leading mineral indicators of the 3rd (K-Mg salt) stage are talc-like minerals and serpentine, in assocn. with **hydrotalcite**-group minerals. The 4th and final stage is represented by bischofite and carnallite-bischofite rocks. These have insol. residues of **hydrotalcite**-group swelling and nonswelling minerals and quartz. In the final Cl-Mg brines conditions were not favorable for active formation of aluminosilicates and Al and Si were dissocd. during authigenic mineral formation.

IT 12304-65-3

(authigenic, in evaporite deposits, stage of Permian basin salinity in relation to, of southeastern Russian Platform)

RN 12304-65-3 HCA

CN Hydrotalcite (Mg₆(CO₃)[Al(OH)₆]₂(OH)₄·4H₂O) (9CI) (CA INDEX NAME)

CM 1

CRN 11097-59-9

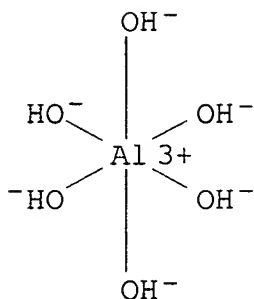
CMF C O3 . 2 Al H6 O6 . 4 H O . 6 Mg

CM 2

CRN 18893-33-9

CMF Al H6 O6

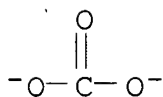
CCI CCS



CM 3

CRN 3812-32-6

CMF C O3



CC 53-5 (Mineralogical and Geological Chemistry)

IT 1318-00-9 1318-93-0, occurrence 12173-60-3 12304-65-3
12413-40-0(authigenic, in evaporite deposits, stage of Permian basin
salinity in relation to, of southeastern Russian Platform)

L25 ANSWER 6 OF 6 HCA COPYRIGHT 2004 ACS on STN

55:98317 Original Reference No. 55:18455h-i,18456h Thermal diagrams of
minerals. Ivanova, V. P. (All-Union Geol. Research Inst.,
Leningrad). Zapiski Vserossiiskogo Mineralogicheskogo Obshchestva,
90, 50-90 (Unavailable) 1961. CODEN: ZVMOEK. ISSN: 0869-6055.AB Under the special working conditions described by Ivanova and
Bindul' (ibid. 89, 560-4 (1960), the differential-thermal curves of
more than 350 minerals, 20-1300°, are collected and
supplemented by 150 diagrams taken from the literature. The curves
are systematically classified according to Betekhtin's chem. system
(Mineralogy, 1950 (CA 47, 6318e)). Some synthetic pure reagents are
given for comparison and a few diagrams of frequent mineral assocns.
Emphasis is given to those minerals which in the original state are
thermo-inert, i.e. they do not show characteristic endothermic or
exothermic effects, but with a high degree of sensitivity, their
"weathering products" can be detected on the differential-thermal
curves of corresponding specimens. The use of cooling curves for
the identification of polymorphic inversion effects is particularly
recommended for complex mineral mixes, e.g. in the oxidn. zone of
ores, for Fe hydroxide deposits, and for gearksutite, etc. The

identification of pyroaurite, which was often misinterpreted as talc in chrysotile asbestos and serpentinites, was thus made possible.

IT 1309-48-4, **Magnesium oxide**
 (thermal analysis of)
 RN 1309-48-4 HCA
 CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

CC 8 (Mineralogical and Geological Chemistry)
 IT Aphrodite
 Asbestos
 Axinite
 Bauxite
 Chlorite-group minerals
 Minerals
 Monothermite
 Pelicanite
 Scapolite
 Serpophite
 Tourmaline
 (thermal analysis of)
 IT Olivine
 (thermal analysis of magnesian)
 IT **Hydrotalcite**
 (and mixts. with calcite and chrysotile, thermal analysis of)
 IT 513-78-0, Cadmium carbonate 554-13-2, Lithium carbonate, Li₂CO₃
 1302-27-8, Biotite 1302-37-0, Spodumene 1302-52-9, Beryl
 1302-66-5, Petalite 1302-74-5, Corundum 1302-75-6, Gahnite
 1302-92-7, Cookeite 1303-42-0, Mimetite 1303-83-9, Danburite
 1306-06-5, Hydroxylapatite 1306-85-0, Atacamite 1309-38-2,
 Magnetite 1309-48-4, **Magnesium oxide**
 1309-54-2, Braunite 1309-55-3, Hausmannite 1310-98-1, Manganite
 1317-43-7, Brucite 1317-45-9, Cassiterite 1318-00-9, Vermiculite
 1318-04-3, Zinnwaldite 1318-10-1, Analcime 1318-25-8,
 Hisingerite 1318-27-0, Carnallite 1318-40-7, Datolite
 1318-49-6, Epidote 1318-52-1, Evansite 1318-82-7,
 Leuchtenbergite 1318-94-1, Muscovite 1318-95-2, Natrolite
 1319-20-6, Scolecite 1319-32-0, Turquoise 1319-37-5, Idocrase
 1319-40-0, Wavellite 1319-45-5, Azurite 1319-53-5, Malachite
 1332-08-7, Wolframite 1337-01-5, Hydrobiotite 1344-28-1,
 Aluminum oxide 3333-67-3, Nickel carbonate, NiCO₃ 7733-02-0,
 Zinc sulfate 7757-86-0, Magnesium phosphate, MgHPO₄ 7778-80-5,
 Potassium sulfate, K₂SO₄ 7789-75-5, Calcium fluoride 12003-09-7,
 Gearsutite 12022-37-6, Hydrolepidocrocite 12026-53-8,
 Paragonite 12027-58-6, Prehnite 12045-47-5, Lueneburgite
 12049-96-6, Miserite 12053-86-0, Linarite 12069-37-3, Bismutite

12122-17-7, Hydrozincite 12125-02-9, Ammonium chloride
12134-66-6, Maghemite 12135-61-4, Sphene 12141-77-4, Xonotlite
12161-82-9, Bertrandite 12168-52-4, Ilmenite 12168-91-1, Ilvaite
12172-67-7, Actinolite 12172-71-3, Allophane 12172-74-6,
Ankerite 12172-81-5, Aurichalcite 12173-13-6, Copiapite
12173-36-3, Gedrite 12173-47-6, Hectorite 12173-71-6, Kerchenite
12173-80-7, Lepidomelane 12174-06-0, Nontronite 12174-11-7,
Attapulgit 12174-53-7, Sericite 12178-42-6, Hornblende
12178-54-0, Titanomagnetite 12191-78-5, Martite 12197-13-6,
Ambatoarinite 12197-71-6, Cyrtolite 12198-09-3, Fuchsite
12198-10-6, Garnierite 12198-97-9, Parisite 12199-21-2, Roselite
12199-80-3, Zirkelite 12251-39-7, Harmotome 12251-43-3,
Microcline 12251-44-4, Orthoclase 12252-41-4, Aluminite
12269-78-2, Pyrophyllite 12280-76-1, Botryogen 12286-77-0,
Abukumalite 12286-87-2, Volkonskoite 12322-47-3,
Picroparmacolite 12324-77-5, Carphosiderite 12351-91-6,
Barbertonite 12351-92-7, Pyroaurite 12362-45-7, Nepouite
12413-28-4, Achtaragdite 12413-31-9, Aidyrlite 12413-58-0,
Aphrosiderite 12413-96-6, Beaverite 12414-82-3, Coronadite
12414-83-4, Corundophilite 12414-85-6, Creedite 12414-97-0,
Dashkesanite 12415-16-6, Donbassite 12416-99-8, Jefferisite
12417-10-6, Kammererite 12418-04-1, Gilbertite 12419-23-7,
Kolskite 12419-98-6, Monheimite 12423-94-8, Oncosine
12424-02-1, Revdanskite 12424-32-7, Sauconite 12424-76-9,
Skolite 12425-11-5, Tabergite 12425-24-0, Thuringite
12426-97-0, Picrolite 13106-47-3, Beryllium carbonate, BeCO₃
13759-07-4, Thenardite 13767-89-0, Glauberite 13778-96-6,
Bischofite 13816-47-2, Pectolite 13824-50-5, Variscite
13827-40-2, Connarite 13950-49-7, Stellatogenin 13983-17-0,
Wollastonite 14020-51-0, Powellite 14291-02-2, Celestite
14374-77-7, Willemite 14457-55-7, Epsomite 14476-12-1,
Rhodochrosite 14476-15-4, Cerussite 14483-19-3, Diopside
14542-23-5, Fluorite 14567-57-8, Rhodonite 14567-58-9,
Mirabilite 14567-73-8, Tremolite 14567-85-2, Aegirite
14590-27-3, Hydrogoethite 14594-79-7, Anglesite 14681-78-8,
Enstatite 14762-49-3, Gibbsite 14791-73-2, Aragonite
14798-04-0, Anhydrite 14807-96-6, Talc 14913-82-7, Wulfenite
14940-68-2, Zircon 14941-39-0, Witherite 14941-40-3,
Strontianite 15079-06-8, Annabergite 15083-77-9, Bloedite
15096-52-3, Cryolite 15118-03-3, Forsterite 15277-00-6,
Roemerite 15278-29-2, Polyhalite 15293-69-3, Erythrite
15491-23-3, Melanterite 15501-85-6, Thorite 15501-92-5,
Huebnerite 15606-25-4, Diopside 15614-46-7, Halotrichite
16102-94-6, Olivenite 16224-20-7, Parasepiolite 17068-62-1,
Hypersthene 17441-13-3, Bronzite 19004-62-7, Breunnerite
19569-21-2, Huntite 20257-20-9, Bayerite 20909-44-8, Scorodite
60686-76-2, Oxykerchenite 61076-94-6, Phlogopite
(thermal analysis of)